The NATIONAL GEOGRAPHIC MAGAZINE

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CONTENTS

PAGE

Address by Commander Robert E. Peary on the Assembling of the Eighth International Geographic Congress in Washington . 387

Some Early Geographers of the United States. By Rear Admiral C. M. Chester, U. S. N. 392

Recent Progress in the Execution of a Map of the World on the Uniform Scale of 1:1,000,000. By Dr Albrecht Penck . . 405

Methods of Exploration in Africa. By Major A. St. H. Gibbons 408

The Special Telegraphic Time Signal from the Naval Observatory in Honor of the Eighth International Geographic Congress 411

Resolutions Adopted by the Eighth International Geographic Congress 415

The Eighth International Geographic Congress 419

Geographic Notes 427

Abstracts of Geographic Congress Papers 430

Geographic Literature 432

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THE NATIONAL GEOGRAPHIC MAGAZINE

ADDRESS BY COMMANDER ROBERT E. PEARY, U. S. N.

PRESIDENT EIGHTH INTERNATIONAL GEOGRAPHIC CONGRESS

ON THE ASSEMBLING OF THE CONGRESS IN WASHINGTON SEPTEMBER 8, 1904

Gentlemen, Delegates, and Members of the Eighth International Geographic Congress:

FOR the first time, America welcomes you and is honored by your presence. For the first time we have the pride and pleasure of extending a hearty greeting to our distinguished friends and co-workers in the great mother science, gathered from the civilized nations of the world.

For the eighth time since its inception the International Geographic Congress meets to note the progress of discovery, to listen to the results of the researches of its Fellows, and to suggest and plan for the future.

Seven times it has met in the great capitals of Europe; now it meets in the capital of your young but buxom sister of America.

Numbers of you meet here again comrades of previous Congresses. Others have attended their last Congress, and survive only in their works.

Stanley and Nordenskjold, captains of the tropics and the Arctic, have passed away in the quiet of their homes, their strenuous work ended years ago.

Daly and Du Chaillu have died amid the peaceful surroundings of civilization.

Andrée and Toll have met their fate in the stress of struggle with the icy North.

There have been numerous "world happenings" since the last Congress, which, while not purely geographical, it may be well perhaps to note here.

When the last Congress met a struggle had been finished in the distant East far-reaching in its effects; the beginning of a new policy, a new line of thought and action, the first step in the inevitable and inexorable destiny of this country.

At the present time another struggle is going on in the same region, fateful with the greatest possibilities to two of our friends and neighbors.

Since the last Congress two republics have ceased to exist in Africa and a new one has been born in America.

In Asia a great new line of communication has been completed—the Trans-Siberian Railway.

Along the wide floor of the Pacific a world nerve vibrates today which did not exist when you last met—the new Pacific cable.

Wireless telegraphy is an accomplished fact today, not an experiment, and the atmosphere of the globe in a short time will throb incessantly with countless messages.

Finally, there is that vision of the centuries, that envious dream of monarchs and ministers since Gomara quested for the "Secret of the Strait" four hundred years ago—the Isthmian Canal, the union of the Atlantic and the Pacific—the grandest project, the greatest engineering, financial, and diplomatic problem of the age.

A fearless master hand has at a stroke cut the Gordian tangle that has hitherto defied the ablest statesmen and financiers of the world, and the nations today accept without question the Panama Canal as a fact.

A few years hence and the commerce of the world will pass freely from the eastern sea to the western sea, traversing almost air lines from port to port, at an enormous saving of time and distance and expense, and this great orient-and-occident-facing Republic will rest content with coasts united from Eastport to the Straits of Fuca.

Much has been done in the geographical world since the last Congress, both in the field and in the study, and the number of possible great discoveries is rapidly narrowing every year.

Only two great prizes now wait the present-day explorer—the North Pole and the South Pole.

It is interesting to note how, from Congress to Congress, the scene of geographical interest shifts from one region to another.

Africa, Arctica, Antarctica have followed in succession. What will it be next, or will some of the old loves continue to claim our advances until full surrender?

The most prominent feature of geographical work since the last Congress has been the activity in Antarctic exploration. The international program formulated at the last two congresses has been carried out, and a large and valuable amount of work done and material secured.

England, Germany, Sweden, Scotland, Belgium, and France have all sent ships to this region, and the result has been to wonderfully increase our knowledge of that most interesting portion of the globe.

I shall not attempt any details or discussion. These we shall have first hand from those who have led the expeditions and been intimately identified with them.

In the Arctic field there has been continued activity.

Abruzzi, the able and energetic young Italian duke, has in a splendid and effective dash recorded the nearest approach to the Pole, and has by his experience eliminated Franz Josef Land from further consideration as a polar base.

Such type of young man, possessing already the prestige of a distinguished name, devoting his time, his abilities, his personal means to the advancement of human knowledge, instead of wasting them upon idle amusement, commands my highest admiration.

The expeditions of Sverdrup and Peary have returned from their four years' absence—one with a magnificent delineation of that previous great gap in Arctic charts, the unknown regions west of Ellsmere Land; the other with the delimitation of the northern terminus of the Greenland Archipelago, the most northerly known land in the world.

Mr Ziegler, with commendable, but, I fear, misdirected persistence, is pushing his attack upon the Pole *via* Franz

Josef Land, and news from his expedition may be received at any time. Amundsen is in the field laying siege to the north magnetic Pole.

But there remains still the Pole itself, and the mystery of that three million square miles about it, which stand as a challenge and a reproach to us.

In Asia, "the roof of the world," there have been numbers of workers.

The American explorers, Pumpelly and the Workmans, have done good work. The latter have attained the highest altitude yet reached by human beings, 7,135 meters.

But the magnificent work of Sven Hedin, the great Swedish traveler, far surpasses that of all other explorers in this region. In fact, this explorer undoubtedly stands foremost in energy and extent and accuracy of his work among the active explorers of the day.

Lhassa, "the Forbidden City," the mystery and secret of central Asia, the unattained objective of many travelers, has been reached and reported upon by several, and today the English military expedition of Captain Younghusband occupies the city. The sacred city of the Llamas is a mystery no longer.

In Africa, once "the Dark Continent," the work of large exploration is at an end, and has been succeeded by the work of division and colonization. No longer the "Dark Continent;" it is known in its geographical entirety better perhaps than South America.

The fine French surveys in the central Soudan, L'Enfant's determination of actual water communication between Lake Tchad and the Atlantic, through the Niger system, and young Grogan's feat, the longitudinal traverse of the continent from Cape Town to Cairo, are worthy of note.

Abyssinia in Africa, like Tibet in Asia, is being traversed and studied by travelers of various nationalities, and Ethiopia is emerging toward a place among the nations of the world.

In North America, "the granary of the world," numbers of explorers have been busy, more particularly in Alaska and the northern portion of the continent, but this work will be so well covered by various members during the meetings of the Congress that I shall not attempt it here.

A feature perhaps of this region has been the recent activity of the Canadian government in exploiting the northern lands, though more in a political than a geographical mood.

In South America the main work since the last Congress has been that of the government boundary commissions.

In Europe, "the metropolis of the world," geographical work is now of necessity a work of detail and rigid scientific development.

Of this class of work perhaps no better example can be given than that inaugurated and carried on by Sir John Murray in the Scottish lakes.

The papers before the Congress cover this work so well that I need to go no further.

In the domain of the oceans the material obtained in connection with the surveys for the Pacific cables and the development of the Pacific "great deeps" stand prominent.

So much for the work in the field, the work which by many is regarded as only the raw material.

As for the advances in the study, the laboratory, the class-room, the text-book, the list of papers before the Congress in the Departments of Meteorology, Technique, Bio-geography, Anthropo-geography, and Mathematical, Economic, Historical, and Educational Geography will attest.

What yet remains to be done? On this I can touch only in the briefest and broadest way, and from a personal point of view. The Congress will determine this question for itself during its sessions.

The fact of my personal interest in the polar field does not affect the truth of

the broad statement that there is no longer any great pioneer work of geographical discovery to be accomplished except at the apices of the earth, at the North and South Poles.

Here alone large areas, guarded by the sternest natural obstacles to be found upon the face of the earth, still challenge and defy conquest.

It has been somewhat the fashion during the past few years, in the interest and enthusiasm excited for Antarctic work, to rather decry further Arctic work as not likely to be of value, and to assume that in the Antarctic region alone is there a field for really valuable scientific investigation.

I do not at all agree with this view. There are no 3,000,000 square miles of the earth's surface that do not contain scientific information of value much greater than the cost of securing it.

Further than this, I believe in doing the thing that has been begun, and that is worth doing, before shifting to a new object.

There is no higher, purer field of international rivalry than the struggle for the North Pole.

Uninfluenced by prospects of gain, by dreams of colonization, by land lust, or politics, the centuries' long struggle of the best and bravest sons of England, Germany, Norway, Sweden, Holland, France, Russia, Italy, and the United States, whose able delegates are here today, has made this field of effort classic, almost sacred.

The conquest of the Pole is a man's work as well as a geographical and scientific desideratum, and its attainment would move the man and the geographer in every one of you.

The South Pole, from a practical geographic point of view, is no less a prize (but I do not consider it a greater) than the North Pole, but the North Pole has a place in history, in literature, in sentiment, if you will, which the South Pole will never hold.

Granted the attainment of the North Pole, or that the attacks upon both can be carried on simultaneously, there is no greater believer or stronger advocate of the value and necessity for South Polar exploration and the desirability of pushing it to the very Pole itself than I.

I will note here but two other geographical feats of primary magnitude yet to be accomplished by the explorer.

The culminating peak of Asia remains yet to be won.

The culminating point of North America remains yet untrodden by human foot.

Large as has been the work done in the last nine years, the three salient resolutions of the Sixth and Seventh Congresses regarding Antarctic exploration, map of the world on a uniform scale, and oceanography still hold good, and I hope to see them reaffirmed by this Congress with a fourth in regard to Arctic work.

It seems to me we ought not to deny the advantages to science of *completing* the exploration of the Arctic regions, when the secrets of an area almost as large as Australia, an area within which a valuable paper before this Congress will indicate the probability of a new land, remain unknown.

And I sincerely hope that this Congress will not ignore a field of investigation which, now that the flood tide of Antarctic exploration has somewhat spent itself, resumes its leading place with five expeditions in the field or preparing to enter it.

The meeting of this Congress in this country holds great possibilities of good for us, both as individual geographers in being brought in direct contact with the work of our colleagues of other countries, who are hewing new paths and broadening old ones, and also as a country.

I earnestly hope that this session of the Congress will prove a great and last-

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ing stimulus to the interest of our people in geographical and allied research.

We need a vigorous stirring up and awakening to the value of such work. With our abundant wealth, with our youth as a nation, our energy, push, ambition, and adaptability, yet as a country we have taken no part in large efforts in the geographical field for the past twenty years, but have allowed you, our friends across the water, to shame us by your splendid examples.

There is ample room for a larger force of active, able workers in the field of geographical investigation.

There is too much money devoted to schools and libraries and too little to the field of exploration and research, which furnishes the facts for instruction in the schools and material with which to fill the volumes in the libraries.

I sincerely hope that the stimulus of this Congress, the breadth and strength of the resolutions which it may pass, and the union here at this Congress, for a common object, of all the American Geographical Associations, all combined, will lead to such a general interest as will enable us to take up some broad scheme of exploration and investigation and pursue it systematically and persistently, not capriciously and spasmodically, to its ultimate end.

Personally I should like to see such an interest aroused as would enable us to take up Antarctic exploration, which our friends across the water have so splendidly begun and prosecuted for the last four years, and which I judge they will not pursue further at present, and with the advantage of their advice and experience, carry it steadily forward.

The whole history of Antarctic and Arctic exploration has been a series of eager spasmodic efforts, attaining a greater or less measure of success, accompanied in many instances by semi-frantic and lavish rescue expeditions, necessary in some instances, not necessary in others, followed by a reaction and apathy till the training and experience gained is forgotten, and a new generation, making another attempt, must begin all over again.

This is not the way. Such spasmodic efforts will never do the work in the way science today demands. There must be continuous work extending over a series of years. The project should be taken up with the understanding that it must be carried on steadily for five or ten or more years ; it must be handled like any humdrum business proposition ; it must be divested of any sensational tendency.

The idea that as soon as a party enters the Arctics or Antarctic circle preparations must begin for the rescue must be thrown to the winds.

The loss of a ship or a few men must be discounted.

Such things happen every day in the maritime world, but it does not keep other ships and men from continuing the same voyages.

The world is getting bigger and wealthier every day.

There are abundant means seeking new avenues of expenditures if only they can be interested. It is a time of big things. Our friends over the water have shown us an example in their munificent Antarctic Expedition.

If our geographical societies and scientific institutions and the government would unite, such scheme of work could be carried on at an annual expense not more than a quarter or a fifth of the annual income of some of our great institutions.

I have taken Antarctic exploration as an example. Personally I should prefer to see that carried out, but it might just as well be the continued systematic study of the ocean on a large scale.

The point I want to make is that the time is ripe, and we should have some broad national project of geographical investigation, of general interest and coördinated plan, on a continuing basis,

instead of frittering away of time and money on a heterogeneous variety of investigations of narrow scope and often of small value.

That there are other fields of investigation of great value and promise within the domain of this Congress goes without saying. Recognized specialists in these fields will bring them to the attention of the Congress in their own masterly way.

I have spoken upon those things upon which I think and feel strongly.

In conclusion, I wish to express our obligations and acknowledgments to His Excellency President Roosevelt, that splendid, vigorous, typical American, who stands at our head today, the fearless, unhesitating man of magnificently wedded thought and action, who has graciously consented to head the Congress;

To Baron Richthofen and his colleagues of the Executive Committee of the Seventh International Geographic Congress, for the way in which they have carried out the work intrusted to them by that Congress;

To our distinguished foreign visitors and friends, who have devoted so much time and effort to be present;

To those who, prevented by circumstances from being present in person, have sent us most valuable papers;

To Professor McGee and his colleagues of the Committee of Arrangements; and

To Professor Davis and his colleagues of the Committee on Scientific Program, for their tireless efforts in behalf of this Congress.

I cannot close without a word or two expressing my deep appreciation of the honor shown me in electing me President of this distinguished organization, a position previously held by such eminent men as De Lesseps, Sermoneta, Gobat, Markham, and Richthofen.

I have accepted the honor in the spirit in which I believe it was tendered, namely, as an expression of the sympathy and approval of the geographers and geographical associations of this country and their interest in the work and aims with which I have been identified for the past fifteen years.

As such, I greatly prize it.

Further, I deeply regret that insistent press of that same work has made it impossible for me to labor for the Congress as I should have done.

The full and entire credit for the Congress, both in scope and detail, is due to the able and tireless chairmen and members of the Committees of Arrangements and Scientific Program and their associates, and to the delegates and members who have contributed the progeny of their brains to make it a success.

SOME EARLY GEOGRAPHERS OF THE UNITED STATES*

BY REAR ADMIRAL C. M. CHESTER, U. S. NAVY

ON an occasion like the present one, when distinguished men from all parts of the world meet together to consult with reference to the means for promoting the great objects for which our individual societies were inaugurated—a study of the earth and its inhabitants—it seems fitting that we should take at least a cursory glance at the work which has been

*An address to the Eighth International Geographic Congress.

done by our forbears in the way of collecting geographical data in order that we may plan for its future development, for it is history that must form a basis for all advancement.

In these strenuous days, when by the means of modern appliances so much is accomplished in a short time, we are apt to forget to what extent we are indebted to the pioneers in new fields of discovery, who by their labors have given to mankind such indescribable benefits, including untold millions of money. Such a matter-of-course has it become that geographical expeditions are now fitted out, even for the antipodes, with only a brief notice in our daily papers, while any story, however unimportant, provided its effect is to startle the mind, is given space *ad libitum*, and in many cases *ad nauseam*.

It is therefore through societies, such as we greet today in the city which is celebrating one of the principal events in geograpical history, to which must be delegated the duty of stimulating our people to further efforts at research in the special field of science which we have met to consider, assuring them that as long as "knowledge is power" no region that is unknown can be too unimportant for investigation.

This must be my excuse for taking up your time for a brief moment in a résumé of a portion of the work done in this cause by the service to which I have the honor to belong, the Navy of the United States. To cover the whole field of geographic exploration in a lecture of a few brief minutes is not within the power of any man, and hence I have restricted myself to the early achievements of this small corps of men with whose accomplishment I am best acquainted, and even as thus circumscribed must confine myself to a bare outline of the reports made, leaving to better hands much to be mentioned.

I think I may say that the United States Navy is one of the oldest, if not the oldest, of all the National Geographic Societies of this country, for scarcely had we become a nation before its officers began a study of our coast, near which in the early days of the Republic the most of its population resided, and of which very little was known. The summation of the information then extant was given in a few incomplete charts handed down from the early surveys, or rather reconnoissances, of our English ancestors that were so unreliable as to be practically useless. As our own coast became more familiar to the people, naval officers began to glean in other fields, and no part of the earth's surface was too distant to claim their attention.

This resulted in establishing a department within our naval administration which was known at first as the U. S. Naval Observatory and Hydrographical Department, and it has given to the world a vast amount of data gained from surveys or investigations in almost every country in the universe. And we must remember that to the U. S. Navy, as Humboldt has placed on record, the world is indebted for founding a new department of science, that of the Physical Geography of the Sea.

But few names stand higher on the roll of honor and but few men have lived whose work has been of more lasting benefit to mankind than that of the distinguished scientist, Commander Matthew F. Maury, late U. S. Navy, who was the originator and most valuable contributor to this branch of science.

SLACUM'S VOYAGE

In November, 1835, President Van Buren directed William A. Slacum, an officer of the U. S. Navy, to proceed to the western coast of the United States and endeavor "to obtain there all such information, political, physical, statistical, and geographical, as might prove useful or interesting to the government."

Slacum traveled through Mexico to Guaymas, and left that port on the 1st of June, 1835, intending to reach Oregon by land, but being informed of the impracticability of using the land route at that season of the year, he proceeded by sea, and after many vicissitudes only reached the mouth of the Columbia River December 22, 1836. Here he surveyed and plotted a chart of the mouth of that river, and also compiled a chart, from information gained, of the coast and country south of the Columbia. The four rivers, Klamath, Coos, Rogue, and Umpqua, which had never before been charted, appear on this map and were thus made known to geographers through his efforts.

THE WILKES EXPLORING EXPEDITION

The most complete exploring expedition ever fitted out from America up to the time of its departure was that which left the United States in 1838. The expedition sailed under the command of the then Lieutenant, afterwards Rear Admiral, Charles Wilkes, U. S. N., who was aided by a most intelligent band of officers well prepared for its onerous duties. The difficulties which attended Wilkes' expedition can hardly be conceived at the present time, when steam relieves the sailor of many cares and clears him from numerous dangers against which his predecessor had to battle formerly with sails only.

On August 19, 1838, the vessels left Chesapeake Bay, and after stopping at Madeira and the Cape Verde Islands arrived at Rio Janeiro, Brazil, from which it sailed on the 6th of the following January. From Rio Janeiro they proceeded to Rio Negro, in Patagonia, and Nassau Bay, in Tierra del Fuego. From this place two schooners attached to the expedition made cruises in different directions toward the South Pole, one of them, the *Flying Fish*, reaching latitude 70° 14′ S., nearly the highest latitude attained by Captain Cook and not far from the same longitude reached by him; but the season had already advanced too far for the best results, and they rejoined the squadron at Valparaiso in May, 1839. The *Vincennes* in the meantime was occupied with a survey of Nassau Bay. The schooner *Sea Gull* was lost in a gale soon after leaving Nassau Bay.

From Valparaiso the vessels sailed to Callao, Peru, where the *Relief*, being ill-adapted to the voyage, was sent to the United States.

On the 12th of July the squadron left the coast of South America and visited and surveyed 14 or 15 of the Paumotu Islands, two of the Society Islands, and all of the Navigator Group, and reached Sidney, New South Wales, on the 28th of November, 1839.

The vessels next proceeded on their second Antarctic cruise, discovering land in longitude 160° E. and latitude 66° 30′ S.

It should be said of Wilkes' discoveries in Antarctica that the recent expeditions of Captain Scott of the British Antarctic expedition, Dr von Drygalski of the German, Captain Bruce of the Scottish, and Captain Nordenskjold of the Swedish, all confirm the correctness of Admiral Wilkes' work in the frozen south, and as Mr Edwin Swift Balch said of him in a recently published article in the NATIONAL GEOGRAPHIC MAGAZINE, "show what a remarkably acute and accurate geographical observer Admiral Wilkes was." Let us not forget in our felicitations for these later gallant voyagers of the present generation how much we owe to the intrepid pathfinder who first announced to the world his discovery of the Antarctic Continent in 1840, nor the fact that his almost miraculous voyages were made in ships some of which would hardly be trusted outside of port at the present date.

During the absence of the expedition about two hundred and eighty islands were surveyed, besides eight hundred

miles of hydrographic surveys on the streams and coast of Oregon, and one thousand five hundred miles laid down along the land and icy barrier of the Antarctic Continent. Numerous islands of doubtful existence were searched for, shoals examined, and reefs discovered and charted; also many harbors were surveyed and several for the first time made known to the world. The latitudes and longitudes of the ports visited were determined with all possible precision, and a large number of the doubtful points in the geography of the Pacific cleared up. All this work was done with the accompaniment of innumerable dangers by land and by sea. The personal adventures alone would fill a volume both startling and interesting in the extreme.

The large number of charts produced from the records of this cruise evince alike the energy and industry of the commander and all his assistants.

There might be mentioned as a sequel to the Wilkes Expedition an examination of the Te Pito Te Henua (Easter) Island in the South Pacific Ocean, which took place under Lieutenant (now Rear Admiral) F. M. Symonds, U. S. N., while on duty as navigator of the U. S. ship *Mohican* in 1887.

The expedition was mainly in the interest of ethnology and generally prehistoric data, but quite an amount of geographical literature was added to our store in the Navy Department and published on the charts of the Hydrographic Office. The *Mohican* brought back to Panama the famous Easter Island statue, and the U. S. ship *Galena*, which vessel the lecturer had the honor to command, continued its passage to the Smithsonian Institution, where a study of it has added data to the scientific literature of that institution.

EXPEDITION TO THE DEAD SEA

One of the early scientific expeditions fitted out by the United States was that for the exploration of the Dead Sea. It was purely a naval expedition, and the selection of this branch of the public service to do the work was wise and economical. By education and familiarity with instruments of precision, naval officers were well fitted to make the surveys and handle the delicate questions of international comity that were likely to arise at that time in a country as turbulent as was that of the Ottoman government, with which its commander was required to deal. Furthermore, the general handiness and adaptability of the sailors, as well as their military training, made them singularly well suited for this class of work.

Lieutenant W. F. Lynch, U. S. N., was given charge of the expedition, and, indeed, he might be said to have conceived it. He was assisted by Lieutenant J. B. Dale and Passed Midshipman Richmond Aulick, U. S. N., two most efficient young officers. The U. S. ship *Supply* was assigned to carry the party to Syria, and left the United States for its destination November 26, 1847.

This novel expedition returned to the United States after an absence of nearly a year, its officers and men having overcome almost insurmountable difficulties. One of the officers, Lieutenant Dale, unfortunately succumbed to the fatigue, privation, and sickness incident to the cruise and gave up his life to the cause.

Besides a report that may be considered classic in character, Lieutenant Lynch brought back with him a large number of specimens pertaining to many of the sciences allied to geography.

The volume comprising the summary of the researches made by the intelligent officers of the party may be found in nearly every scientific library of the country.

EXPLORATION OF THE VALLEY OF THE AMAZON

In 1850 Lieutenant William L. Herndon, U. S. N., who had made a reputa-

tion as an explorer by very considerable service in Chile, was sent by the United States Government to explore the valley of the Amazon. He directed his course over the Andes from Lima, Peru, and, reaching the headwaters of that river, followed it to the sea. The object of the expedition was to ascertain the resources and future capabilities for trade and commerce of that immense watershed.

His valuable and instructive report was published by Congress and has remained ever since as the foundation for different expeditions, some of which will be referred to later.

He ran a line of soundings from the source of the Amazon, among the mountains, to its mouth in the Atlantic Ocean, and found it navigable for vessels of the largest class from the sea to the base of the Andes, a distance of nearly 3,500 miles. He also determined the geographical positions of important points at many places along its banks.

His assistant, Lieutenant Gibbon, also of the navy, taking a more southerly route embarked upon the Mamore River at Cochabamba and descended that river to the Madeira and thence to the Amazon.

On two later occasions the government of the United States sent expeditions for surveying this river, one in 1878 consisting of the U. S. ship *Enterprise*, under command of Commander, now Rear Admiral, T. O. Selfridge, U. S. N. From the results of this work the Navy Department published navigation charts of the Amazon up to the bar of the Rio Negro, and of the Madeira up to the falls of San Antonio. These charts are now used to navigate the ships of nearly every country of the world which do business in the basin drained by this mighty river.

The next expedition was under the command of Captain C. C. Todd, with the U. S. ship *Wilmington*, which vessel steamed up the river as far as the city of Iquitos, a distance of nearly 2,400 miles, arriving there on the 23d of March, 1899. Captain Todd's report is replete with valuable information of a practical as well as of a scientific character, and the Navy Department has made extensive use of it.

The pathfinder in these waters, Herndon, ended his life in one of the most gallant and tragic episodes of the navy, going down with the steamship *Central America*, which he commanded, after refusing to get into the last escaping boat lest its capacity might be overfilled.

EXPLORATIONS IN THE RIO DE LA PLATA

Commander T. J. Page, U. S. N., in the U. S. steamer *Water Witch*, with a complement of intelligent officers, was, in the year 1854, engaged in an exploration of the Rio de La Plata and its tributaries. The results of his labors and tactful association with the citizens of the valley of that wonderful river was a most valuable contribution to our geographical knowledge of the whole watershed drained by it.

This great river system had just been opened to commerce, and the results of the voyage of the *Water Witch* were to prove to the world that ocean-going commerce could ascend the Paraná and Paraguay rivers to a point 700 miles above Asuncion, a city that is itself as far from the sea as St Louis is from the Gulf of Mexico.

During the progress of this important survey daily astronomical observations were made and soundings taken and charted along a length of river bed of 3,600 miles, much of the surrounding country was explored, and natural history collections made that were of great value to science, art, and commerce.

ASTRONOMICAL EXPEDITION TO CHILE

Lieutenant James Gilliss (afterwards Commodore), U. S. N., who was the founder of the U. S. Naval Observatory

and published the first American volume of astronomical observations, was also a large contributor to our geographical literature.

While he was director of the Astronomical Expedition to Chile in 1853, he was industriously engaged in collecting data touching the geography and statistics of that interesting country. One of his associates, Lieutenant McRae, U. S. N., returned to the United States by crossing the pampas to Buenos Ayres, procuring matter of great interest for his report of the trip, and later he returned to make further investigations regarding the interesting section through which he passed.

By their combined efforts the common geographical treasury of the world was largely augmented.

EXPLORATION AND SURVEY OF THE PANAMA ISTHMUS

Many attempts were made to fathom the almost "terra incognita" of the Panama Isthmus before the middle of the 19th century without more than negative results being produced; but the growing importance of the commerce of the United States created a strong pressure on the part of the American people to seek to break the barrier separating the two oceans which bound this country.

The people then naturally selected the Navy of the United States, whose main duty in peace times is to carry the flag into distant countries, to explore the Isthmus of Panama, and willing leaders were found to attempt to make a passage through the almost impenetrable forests of that wild country.

The first requisite of a canal which would carry our ships from ocean to ocean necessitated not only a crossing, but the lowest crossing that could be found, and as the axiomatic statement that "the bed of a stream or river furnishes the line of lowest levels in the basin drained" was early propounded as the basis for the exploration, the wisdom of the selection of the "hydrographers" of the country to do the work was self-evident.

It might be said that the commander-in-chief of all the expeditions which operated on the Isthmus was Rear Admiral Daniel Ammen, U. S. N. In the very beginning of the systematic investigation of the problem to which now has been found an answer he took great interest, and early and late hammered at the problem until the day of his death. Balked in his desires to personally lead a party in the field, using the commanding influence of his great friend, President Grant, who had called him to Washington mainly because of his extensive knowledge of this subject, he was instrumental in fitting out several expeditions to survey routes for the canal.

I need not go into the numerous details of the surveys made on the Isthmus of Panama by American naval officers to show how much the final project to join the Atlantic and the Pacific Oceans owes to them for its present promising condition, and indeed I must content myself with barely mentioning some of the names of the gallant officers engaged in this important undertaking, beginning with the attempt at exploration by Lieutenant Strain, U. S. N., in 1844. This expedition was unfortunate as far as its personnel was concerned, but nevertheless the information acquired was of great utility, negative though it may have been; for it has been only by a process of elimination that a final conclusion was reached as to relative advantages of the many routes presented to geographers for discussion. Strain proved that the Darien route was impracticable, and notwithstanding the mishaps of the party the results obtained created such emulation among his brother officers that they never let the matter drop until the final plans for building the "World's Canal" were completed.

The name of Lieut. T. A. M. Craven might also be mentioned in connec-

tion with the early explorations of the Isthmus, although his work consisted mainly of hydrographic surveys and a verification of the data made by other hands.

At the present time we have the distinguished naval officer, Rear Admiral John G. Walker, U. S. N., who followed Admiral Ammen in office as well as in his zealous advocacy of the scheme, as President of the Isthmian Canal Commission, which is to bring this wonderful undertaking to a final completion.

Of the fully organized surveying parties to enter the field for canal exploration the first was the Darien Expedition, under the command of Commander T. O. Selfridge, U. S. N. This expedition examined the Caledonia, Morti, and San Blas routes. The same expedition the next year (1871) surveyed the Atrato-Peranchita-Tuyra route. These surveys eliminated and settled many questions touching the practicability of building a canal.

Captain R. W. Shufeldt, U. S. N., in 1870, ran a level and transit line between Salina Cruz, on the Pacific, to the junction of the Blanco and Corte rivers, to develop the Tehuantepec route, but with his limited force it was not found possible to continue the line to the Atlantic. The information obtained, however, in connection with the results of the desultory examinations previously made, gave a very good idea of what the route was to be.

The Lake Nicaragua route, which was for a long time a favorite field for study, was given a thorough examination by several parties, the first being in charge of Commander A. F. Crossman, U. S. N., whose untimely death by drowning in the surf on the bar at Greytown disturbed for a time the progress of the work. Commander Chester Hatfield, his successor in command, then made an incomplete survey of Lake Nicaragua, which was stopped by the lateness of the season during which he operated.

The next year, 1872–'73, Captain E. P. Lull, U. S. N., who had been Selfridge's assistant in the Darien Expedition, completed the work of surveying this important route with such success as to give, as he said, a "close approximation to the best line which was to be found." Followed in command by Lieutenant F. W. Collins, U. S. N., further critical examinations were made, and a most exhaustive study begun by nearly all the officers who had been engaged upon the field work. They were assisted by that indefatigable expert, Civil Engineer Menocal, U. S. N., whose name will ever be linked with that of Nicaragua. Captain Lull soon after went to Panama for the purpose of making a close instrumental examination in the vicinity of the Panama Railroad.

His expedition practically completed the series of explorations undertaken by the United States, which furnished data covering the whole Isthmus as far as it is applicable to ship-canal purposes.

But by no means did this end the study of the field of possibilities, which has at last by a process of elimination culminated in the final plan to build the American canal at Panama, thus solving the world's greatest problem.

EXPLORATIONS IN CALIFORNIA

To another naval officer, Lieutenant Edward Fitzgerald Beale, U. S. N., America is indebted for many important explorations in the Far West, which followed his services in the navy on the California coast. He was the first who brought to notice the discovery of gold in that then distant state, which resulted in accumulating vast wealth for his countrymen and a great expansion of its domains. Beale became one of the first superintendents of Indian affairs in California.

HYDROGRAPHIC WORK IN THE ATLANTIC BY LIEUTENANT LEE

Before the advent of submarine cables gave rise to the necessity for an accurate knowledge of the bed of the ocean,

no particular attention was paid to the subject; but that distinguished physical hydrographer, Commander Maury, U. S. N., early saw the necessity which might arise for this knowledge in dealing with the question of encircling the globe by wire, and he lent his commanding influence to the making of an examination of the bed of the ocean.

Such research work as was required could only be carried on under governmental control and by the scientific seamen whom the government had in its employ. Hence in the fall of 1851 the U. S. brig *Dolphin*, under the command of Lieutenant S. P. Lee, U. S. N., was commissioned for a cruise which had an important bearing upon the commerce of the world.

The charts of the North Atlantic Ocean showed a mass of representations of rocks and shoals which had accumulated for many years, many of them of doubtful character and position, and yet no government seemed to feel the responsibility for making an investigation or expunging them from their charts. The work of investigating fifty-six of these doubtful dangers was assigned to Lee in the *Dolphin*, and he was at the same time to be employed "for testing new routes and perfecting the discoveries made by Lieutenant Maury in the course of his investigations of the winds and currents of the ocean," as authorized by an act of Congress dated March 3, 1849. The *Dolphin* returned to the United States in the summer of 1852, after an absence of eight months, during which the navigation of the Atlantic had been rendered safer and important contributions had been made toward the advance of knowledge in physical geography, meteorology, and other sciences.

Beginning with this expedition, if I were to complete the record and give the names of all naval officers who have taken a part in the study of oceanography, it would be almost necessary to copy the U. S. Navy Register. But of Lieutenant Brooke, who was the inventor of a method for detaching heavy weights which were dropped when the sounding line touched bottom; of Rear Admiral Sigsbee, who invented the first real sounding machine, and of Captain J. E. Pillsbury, who first solved the problem of anchoring ships in hundreds of fathoms of water and gave the first comprehensive study of deep ocean currents, mention must be made, but no amount of praise from me can add to their well-deserved world-wide reputation. This labor of investigating the bottom of the ocean has been so utilitarian in purpose that hardly a wire lies on the bed of the Atlantic or of the Pacific Ocean that has not been prearranged by the surveys of United States naval officers; and one of the glories of the U. S. Coast and Geodetic Survey, in which service until very recently naval officers have been employed as hydrographers, is that it has sounded minutely nearly 300,000 square miles of water and made deep-sea soundings over little less than a million square miles.

THE UNITED STATES NORTH PACIFIC EXPEDITION

This expedition was authorized by an act of Congress of August, 1852, which appropriated a large sum of money for use "in prosecuting a survey and reconnoissance for naval and commercial purposes of such parts of Bering Strait, of the North Pacific Ocean, and the China Sea, as are frequented by American whale-ships and trading vessels in their routes between the United States and China."

The vessels of the expedition were the U. S. ship *Vincennes*, the steamer *John Hancock*, and the brig *Porpoise*; also the steamship *John P. Kennedy* and the tender *Fenimore Cooper*.

The command of the expedition was first assigned to Commander Cadwallader Ringgold, an officer who had distin-

guished himself by his former participation in a work of like nature.

The squadron sailed from the United States in June, 1853, and proceeded to China by the way of the Cape of Good Hope and the Indian Ocean, reaching Hongkong, China, March 16, 1854. The civil war then raging in China, which required the constant attention of the squadron, prevented much surveying work in the first year.

Ringgold having become incapacitated for duty, Lieutenant John Rodgers, U. S. N., assumed command of the expedition and administered it to a successful ending. The details of the surveys made by Rodgers can not be dwelt upon here, but from the data collected there were made fifteen charts of harbors and special localities and twenty charts of island groups and extensive coasts and seas, among which were charts of the Bonin Islands; the Liu-Kiu group, and the islands to the westward; the mouth of the Pei-Ho River, as well as the Miao Tao Strait; the ports of Japan and the Tsugaru Straits, and ports in Kamchatka; the Aleutian group, and the first American chart of Bering Sea.

In September, 1855, the brig *Porpoise* foundered with all hands on board during a terrific typhoon that swept the China Sea of many ships, and thus was lost to the expedition, the navy, and the country, as the Secretary of the Navy stated, some of the most gallant and intelligent young officers that ever graced the service.

Captain Rodgers with the *Vincennes*, after entering Bering Strait on July 16, 1855, proceeded northward for the purpose of verifying the position of land placed upon the charts by the report of Captain Kellet, of H. M. S. *Herald*, in about latitude 72° N., longitude 175° W., and also to examine, if possible, Plover Island, which had been reported as seen by that officer, and he was then to endeavor to reach Wrangell Land. Running for Wrangell Land, which at that time had never been seen by Europeans, he failed to discover it, although he went within 16 miles of its reported position. Curiously enough, it was the vessel named after him, the U. S. ship *Rodgers*, which twenty-six years later, under the command of Lieutenant R. M. Berry, U. S. N., succeeded in reaching and charting this unknown land.

Having penetrated up to that time farther north in the Bering Sea route than any one else, Rodgers' Expedition returned to San Francisco and later made a cruise of exploration, searching for doubtful dangers in the Pacific Ocean to the westward of that port. After making a survey of Hilo Bay, Island of Hawaii, the *Vincennes* returned to New York by way of Cape Horn.

Besides a vast amount of geographical data sent to the Navy Department, Rodgers turned into the Smithsonian Institution natural history specimens to a considerable amount and of much value, and, as predicted by the Secretary of the Navy, the labors of the officers and men of the expeditionary force proved not only of great benefit to commerce, but also made interesting contributions to science.

COMMODORE PERRY'S EXPEDITION TO JAPAN

Probably no naval officer, and surely no U. S. naval officer, ever gained a greater triumph in foreign lands—a triumph the benefits of which have enriched all nations and whose full fruition is inconceivable even at the present time, a half century after the expedition which brought it about entered upon its work—than Commodore Matthew C. Perry, whose expedition opened to the civilized nations of the world the Empire of Japan about the middle of the nineteenth century.

The expanding interests of the United States incident to the discovery of gold in California and the rapid settlement

of that section of the country were just bringing into prominence the importance to us of the Pacific Ocean, when Perry, with great wisdom and forethought, announced the opinion that "it is self-evident that the course of coming events will ere long make it necessary for the United States to extend its territorial jurisdiction beyond the limits of the Western Continent, and I assume the responsibility of urging the expediency of establishing a foothold in this quarter of the globe as a measure of positive necessity to the sustainment of our maritime rights in the East."

The Navy Department soon after fitted out an imposing fleet under the command of this distinguished officer, who sailed for China early in 1853. The main results of that expedition, which brought into the community of civilized nations that wonderful country which has long since passed out of leading strings and has not only become a world power, but a *great* world power, need not be dwelt upon here. My object is to give a brief statement of its scientific accomplishments, which have been so eclipsed by its greater achievements of commercial importance as hardly to be remembered at the present time.

During all the time that negotiations were going on for a treaty that should secure protection and kind treatment to all Americans who might through any cause find themselves within the jurisdiction of the Japanese people, as well as grant privileges never before conceded to them, Perry used his large force in making surveys and studying the then little known countries which he visited. These included an extensive reconnoissance of Yedo Bay, up to within a distance of seven miles from the capital, and of the Liu Kiu Archipelago, where he established a port of refuge at Naka. While waiting at Naka to gain the confidence of the people of the group, which was a conquered dependency of Japan, Perry sailed to the Bonin Islands, and with two of his ships entered and established a harbor of refuge at Port Lloyd. He caused the principal islands to be explored and gave to the inhabitants varieties of garden seeds and some animals. He accumulated a large amount of geographical data, from which were made several charts of the Liu Kiu group of islands. Later the ship *Plymouth* was sent to the Bonin Islands to explore the interior of that group.

A monument recently established by the Japanese people at the place where Commodore Perry landed commemorates the important event which there took place, thus evincing the high appreciation which they hold for this distinguished man, who had reflected new honors on his country and its navy.

SURVEYS IN JAPAN

Lieutenant Murray S. Day, U. S. N., who was appointed as surveyor-in-chief in the Kaitakushi of Hokkaido, reports from Tokio, Japan, under date of March 27, 1876, that the preliminary work in the triangulation (Island of Yesso) has been extended over an area of about 12,000 square miles; that the survey of the coast line (as well as special surveys of the principal towns and villages of the coast) has been completed; that the accurate length of the Yubutsu base line has been determined by three measurements, and that the Hakodate base also has been prepared for accurate measurement; that the difference of longitude between Sapporo and Hakodate has been determined by the telegraphic method, and that a general map of the island has been constructed which shows the progress of the survey up to the close of the year, besides numerous sectional maps of coast lines, towns, and rivers, etc.

For a period of three years Day continued the work of organizing Japanese students into surveying parties and su-

perintending, in the survey of the Island of Yesso, all the field operations that underlie a scientific survey of large extent, including astronomy, triangulation, topography, and hydrography. It will be a source of congratulation to Americans to know that among the students that were trained by Day appear the names of some of the engineers upon whom Japan has relied in the past generation to take a leading part in carrying forward the magnificent geographical work that has now been accomplished in that empire.

Thus it might be said, as a sequel to the vast commercial and political advantages accruing to the civilized nations of the globe from the wise administration of Commodore Perry, an additional claim may be made in behalf of the Navy of the United States for the further development of Japan as a civilized nation resulting from Lieutenant Day's work.

In a like manner, as a sequel to the work of the United States North Pacific Surveying Expedition, the last chief of which was Commander John Rodgers, U. S. N., reference might be made to the surveys and explorations in China and Korea which took place under that officer while he was a rear admiral in command of the U. S. fleet on the Asiatic station in the years 1870–1873.

Rodgers, who, like his uncle, Commodore Perry, was a man of advanced ideas, was particularly interested in bringing into the civilized community of the world the then hermit nation of Korea. With the five vessels of his squadron he anchored off the Ferrières Islands, on the Korean coast, on the 19th of May, 1871, all hands full of high hope that at last this unknown country was to be opened to us, and through us to the people of the globe. But, though balked in his attempt to penetrate the fortified barrier surrounding Korea, Rodgers kept his officers and men busy in making surveys of such parts of the coast as could be reached, and the expedition brought back its share of glory and a considerable amount of data of a geographical character. Not only here, but in China also, did he keep his command occupied, and several surveys were made in the Yangtse River and elsewhere.

OBSERVATIONS UPON THE KOREAN COASTS AND SIBERIA

It was left to a brother officer of Admiral Rodgers, the late Rear Admiral R. S. Shufeldt, U. S. N., to accomplish what, but for the former's unfortunate conflict at arms with the Koreans, must have resulted in success, namely, to give to this hermit nation the blessings of civilization by inducing them to open their ports to the commerce of the world.

While many other nations besides the United States were enabled at the same time to make satisfactory treaties with the King of Korea, yet to Commodore Shufeldt, who, when in command of the U. S. ship *Swatara*, visited his capital and there took the initial steps toward swinging open the gates of the the country to the world, credit must be awarded for its accomplishment.

Immediately after the then Commodore Shufeldt had completed the treaty negotiations with the Korean Government at Inchon, on the west coast of Korea, three young officers—Lieutenant B. H. Buckingham, Ensigns George C. Foulk and Walter McLean—proceeded from Japan to the United States *via* Korea and Siberia for the purpose of studying the countries passed through. Their report is made up of over 160 pages of printed matter and is full of geographical and other information which at that time was greatly needed.

ARCTIC DISCOVERERS

The attempt to discover the Northwest Passage—the great geographical problem of the age in the early half of the nineteenth century—having allured

many an intrepid voyager to destruction, finally reached a climax in the reported loss of Sir John Franklin's expedition to the polar seas in 1847. This event cast a gloom over the British Isles and produced in this country the most profound sympathy and a determination to use all practical means to relieve the surviving members of the expedition. For the purpose of searching for the lost party, Henry Grinnell, Esq., of New York, offered to fit out two ships. The Government and Congress of the United States gave the scheme their cordial support, assumed the responsibility of equipping the vessels, and made the expedition national in character. Volunteers from the U. S. Navy were called to man the ships, and among the first to answer were Lieutenant Edward J. De Haven and Passed Midshipman Samuel P. Griffin. The former was placed in command of the expedition in the *Advance*, a brigantine of 144 tons, and the latter became his assistant in command of the brigantine *Rescue*.

The chief object of the expedition was the search for Sir John Franklin, but De Haven was directed by the Secretary of the Navy "to pay all due attention to subjects of scientific inquiry."

The Secretary of the Navy in his report of November 29, 1851, said:

"The expedition under Lieutenant-Commanding De Haven to the Arctic seas in search of the British Commander Sir John Franklin and his companions returned to the port of New York in October, having discovered only supposed traces of the objects of which it was in quest, and leaving in entire uncertainty their actual fate. . . . Though failing in the main object of the search, Lieutenant De Haven and his officers verified by their explorations many facts before unknown to science, but indicated in the course of investigation carried on at the Naval Observatory." From his data Grinnell Land was added to our charts.

The journal of Passed Assistant Surgeon E. K. Kane, U. S. N., the surgeon of the expedition, is replete in notices of natural features of the Arctic Zone which have now become history, and so well did he do his share of the scientific investigations of the expedition, in addition to his duty of caring for the sick, that he was selected to command the second search party.

This second party of seventeen persons in the same brigantine *Advance*, which had been a home for some of them in the De Haven Expedition, again crossed the Arctic Circle, and for two years and more made history for themselves and an honorable record for the Navy. Time does not permit an account of it more than to note that it was unsuccessful in the main object of the search, and was so overwhelmed by insurmountable difficulties as to require another search party in its own behalf. This was also a naval expedition, under command of Captain Henry J. Hartstene, U.S. N., comprising the purchased bark *Release* and the steamer *Arctic*, with forty officers and men for a crew. It brought back to the United States fifteen members of the Kane party and his vast store of geographical and scientific data, which, but for the relief party, might never have been found.

In 1870 Charles Francis Hall was directed to organize an Arctic polar expedition under the supervision of the Navy Department, and the U. S. ship *Polaris* was selected as a home for the force to be employed under his command. The expedition passed through the waters between Greenland and British America as far as latitude 82° 16′ north, a point much nearer the North Pole than had ever been attained up to that period. More than 700 miles of coast line were discovered or recharted, and it then became known that Kennedy's Channel opened into another body of water, to which Hall gave the name of Robeson Channel, in honor of

the Secretary of the Navy. Land was also discovered extending as far north as the 84th degree of latitude. Captain Hall died at Polaris Bay in 1871, and the expedition was shipwrecked and so delayed in returning to the United States that the Navy Department sent out a relief expedition composed of the U. S. ship *Juniata*, Commander D. L. Braine; the U. S. ship *Tigress*, Commander James A. Greer, and the steam launch *Little Juniata*, belonging to Braine's ship, was dispatched by that officer for the same purpose under command of Lieutenant G. W. De Long. This force obtained results which still further added to the fruits of the original expedition, the records of which were saved.

De Long in this search work acquired such a taste for exploration that he did not rest until he had obtained the command of a ship which was donated by Mr James Gordon Bennett, of New York. The *Jeannette* was fitted out by the Navy Department, under the authority of an act of Congress, for the purposes of north polar exploration. Being impressed that the problem of chances was in favor of the Bering Sea route, De Long, proceeding through Bering Strait, passed to the northwestward, with the object of reaching the North Pole.

The sad fate of this expedition is of too recent date to require a story here. De Long discovered Jeannette, Henrietta, and Bennett Islands, and they are charted and stand as monuments to the bravery, fortitude, and intelligence of this daring explorer. One little episode of the expedition—that of two of his party who were sent in search of food for their dying companions, returning with one little bird they had shot to divide up between eighteen stricken men—shows the wonderful control De Long, Chipp, Danenhower, Melville, and Ambler had over their men.

The country went into sincere mourning over the death of almost the entire party, but "their works shall live after them," and the story of their heroism is left us as a precious heritage.

In June, 1881, Lieutenant R. M. Berry, U. S. N., was sent with the U. S. Ship *Rodgers* to search for De Long's missing party, and in a fruitless attempt to penetrate the ice pack which had closed over the ill-fated *Jeannette* the officers of the *Rodgers* first surveyed Herald Island and afterward circumnavigated and charted Wrangell Island, proving conclusively that it was not a part of the Asiatic coast, as had been supposed by some geographers. With a view of affording every possible relief to the *Jeannette* Expedition, the U. S. ship *Alliance*, Commander George H. Wadleigh, was also sent in search of De Long. Wadleigh brought back a large amount of geographical data, as well as specimens relating to different sciences. Unfortunately, Berry's vessel was destroyed by fire in the frozen regions, but his party was saved. Still in pursuit of information concerning the *Jeannette*, Berry traveled afoot across northern Siberia from Bering Strait to the mouth of the Lena Delta, and returned to the United States, and by his trip contributed to the geographical treasury no small amount of information.

With our distinguished President of the Congress, Commander Peary, soon to tell his story, it would be presumptuous in me to make reference to what he, another naval officer in whom we all take great pride, has done for geography and science in general. Your votes, which have called him to this high office, show that his reputation belongs to the world as well as to the United States Navy.

PLAN OF A MAP OF THE WORLD

RECENT PROGRESS IN THE EXECUTION OF A MAP OF THE WORLD ON THE UNIFORM SCALE OF 1 : 1,000,000 (SIXTEEN MILES TO THE INCH)

By Dr Albrecht Penck, of the University of Vienna

THE Fifth International Geographical Congress, held at Berne in 1891, resolved to consider the plan of a map of the world on the uniform scale of 1 : 1,000,000, the sheets of which were preferably to be limited by meridians and parallels. A committee was appointed to deliberate on the question, and I had the honor of transmitting to it special propositions for such a map. But the work of the committee could not advance and a formal invitation to the different states to nominate special delegates to join the committee was not successful. The Congresses held at London in 1895 and at Berlin in 1899 could also not do much for the plan, and thus it seemed to many as if the plan would not be carried out.

In the last five years the situation has totally changed, and I am happy to be able to show to this Congress three maps which are worked essentially after the specifications for a map of the world on the scale 1 : 1,000,000. France made the first steps. The geographical service of the army had several years before studied in detail the propositions for such a map, and when the Cuban war and the disturbances in Persia and China attracted the attention of military men to the Antilles, Persia, and China the French service issued a series of maps of those parts of the world on the uniform scale of 1 : 1,000,000, limited by parallels and meridians. These sheets appear by execution and arrangement as parts of a general map of the world. Thirty-one sheets are already issued, twenty are in progress, and six planned.

The Cartographical Department of the Royal Prussian Land Survey has begun to publish a map of eastern China on the same scale of 1 : 1,000,000, the sheets here also being limited by meridians and nearly by parallels. Though this map intends to represent only eastern China, it adopts the scheme of a map of the world. Twenty-two sheets are planned, of which two are already completed. Finally, the much-discussed projection of a map of India on the scale of 1 : 1,000,000, with sheets limited by parallels and meridians, induced the Intelligence Division of the War Office at London to begin the publication on this scale and projection of a large map of Africa, which will embrace not less than 132 sheets, similarly limited. Eighteen of them have already appeared. Thus we have received in the last four years from France, Germany, and Great Britain three series of maps, containing 61 sheets, which are worked out on the same scale and on the same style of division of sheets. The maps cover large parts of the earth, nearly 10,000,000 square miles being represented on them, and they will ultimately embrace a whole continent, Africa, and very large parts of another, Asia, and parts of America. The maps realize in a large measure the proportions for a map of the world. They are executed on the same scale and represent parts of the earth's surface in such a way that they suffer almost nothing by the deformations of the chosen projection, each sheet of the French and English map being represented on its own plane, which is a face of the sphere of the earth, and the German maps being drawn on a cone, which touches the earth in China in

such a way that there is only a very little amount of deformation.

It is thus for the first time that distant parts of the earth's surface are represented so that they can be directly compared with one another. One who is familiar with Cuba needs only to lay the French map of this island at the side of the German or French map of China to see at one glance the space which has been overwhelmed in the Russian-Japanese war. A student of the coast lines can now compare the bays of Shantung with those of Cuba, and another can compare the behavior of the rivers in South Abyssinia with those in South China, and a third will be able by the chosen projection to determine the exact areas of lands, rivers, basins, lakes, and so on.

All this indicates considerable progress in the practical and theoretical study of different parts of the world, a progress which is not essentially affected by the fact that the maps are not as uniform as was desirable. Uniformity reigns as to scale and nearly as to the limitation of the sheets, each of them embracing a surface lying between 4 degrees of latitude and 6 degrees of longitude, but their arrangement is based upon different parallels and meridians. The English and the French maps use the equator as the initia parallel of the zones of the sheets; the German sheets, however, use the parallel of north. Still greater variety reigns as to the limiting meridians. The English maps use as the initial meridian for the columns of the sheets that of Greenwich; the German that of 4 east latitude; the French that of Paris. The French sheets of China do not therefore correspond to the German sheets of China, and if the Indian map be executed and the French map is extended over larger areas of Asia, as planned, its sheets will overlap the Indian sheets. Thus much double work will be done and the English and French maps can not be directly joined. The same trouble will happen with the English and German maps. We have in the English, French, and German maps not sheets of *one* map, but sheets of different maps, though each of these maps realizes the advantages of a map of the world.

In execution the different maps are based on the same principles that are proposed for a map of the world and now in general use. Water is represented blue, mountains by brown or gray shading or sketched contour lines; names and some ways of communication black, on the German and the French map partly red. But there are differences in the adopted signs for towns and in the style of lettering the names, though each separates duly the names of rivers, mountains, and townships by the character of the lettering. Greater differences exist in the measures adopted for height indications; the German and French maps use the meter, the English the foot. The greatest differences, however, lie in the orthography of names and in the fact that we see on the several series of sheets geographical terms in different languages. In all these respects the maps stand on a national and not on an international basis, and do not show that uniformity which one might wish for a map of the world. But it must be admitted that in many of these respects strong uniformity can be reached. The state of our geographical knowledge does not allow us to represent all countries with the same degree of accuracy; there can not be perfect uniformity in their representation; there will always necessarily be a certain liberty of representing unlike phenomena. The orthography used by the civilized nations being different, there can be no uniform orthography of geographical names, and the international orthography must depend for all those countries which use the Latin alphabet on a national base. Uniformity can only be reached as to a scale, as to the projection

of each sheet on its own plane, and as to the adopted geographical units. As to these three points, the first is quite and the second nearly uniformly treated in our maps; differences only exist as to the third, and here I believe that the Congress could advance future work very much by a resolution in favor of a certain initial meridian and of the geographical measures to be used on a map of the world. This resolution should, in my opinion, be in favor of the initial meridian of Greenwich and of the metric system, the latter being now introduced in many different countries of the world, and being technically adopted both in the United States and in Great Britain.

But an International Geographical Congress held in America could go still further. There are now more than 40 millions of kilometers, approximately a fourth part of the surface of the land, in process of being represented on maps on the same scale of 1 : 1,000,000, with important common features, and this quarter of the land belongs for the most part to the Old World, although a few American sheets have been executed by France. It would be a very important result of the Congress if it could induce the United States to do for America what Great Britain is doing for Africa—*i. e.*, to issue a uniform map for both continents of America. The want of a general map on a scale of 1 : 1,000,000 is felt very much not only for South America, on which continent only a few states, as Argentina, have maps on such a scale and a still larger one, but also for Canada, for Mexico, and the United States. Wonderful work has been done in the United States by topographers; excellent maps are edited by the Coast Survey and the Geological Survey. The coasts are prepared on a scale of 1 : 80,000, the interior on the scale of 1 : 62,500, 1 : 125,000, and in the Far West of 1 : 250,000; but there is such a want of general maps that a visitor to the United States is much at a loss what map to take as a companion. I studied this question seriously when fitting myself out for the excursions of the Congress, and, finally, I found that the best general maps of the United States are made in Germany, and I chose the maps of the new Stieler Atlas as companions; those of the previous edition had already accompanied me to the United States in 1897 and had proved very satisfactory. They contain as much as the scale can afford. This is 1 : 3,700,000. But this scale is far from being sufficient for containing such details as a traveler wishes to know, and it is far too little to give the impression of the grandeur of the country. The scale of 1 : 1,000,000 would be as necessary for a general map of the United States as it is for general maps of European countries. The atlases of Vivende Saint Mirtin, of Andree, of Debes, of Sohr-Berghaus, have adopted uniformly that scale for their maps of central Europe and France, and in those atlases we already find the material for a map of large parts of Europe on the scale of 1 : 1,000,000.

A map of America on the scale of 1 : 1,000,000 would at the same time be the third part of a general map of the world if it were based on the same general plan which is followed by the English, French, and German maps. The system inaugurated by the French map to limit the sheets by parallels of 4° to 4° and by meridians of 6° to 6° has been adopted by the other countries. The same system would be appropriate also for an American map, if at the same time it followed the arrangement of the English map by taking the equator and the meridian of Greenwich as initial dividing lines of the sheets. As to indication of heights, I would propose the adoption of the meter, already used in the French and German map. The latter is a model solution of the important question of geographical measures; it has adopted the Greenwich meridian and the meter. As to the style of execution of the sheets for the United

such a way that there is only a very little amount of deformation.

It is thus for the first time that distant parts of the earth's surface are represented so that they can be directly compared with one another. One who is familiar with Cuba needs only to lay the French map of this island at the side of the German or French map of China to see at one glance the space which has been overwhelmed in the Russian-Japanese war. A student of the coast lines can now compare the bays of Shantung with those of Cuba, and another can compare the behavior of the rivers in South Abyssinia with those in South China, and a third will be able by the chosen projection to determine the exact areas of lands, rivers, basins, lakes, and so on.

All this indicates considerable progress in the practical and theoretical study of different parts of the world, a progress which is not essentially affected by the fact that the maps are not as uniform as was desirable. Uniformity reigns as to scale and nearly as to the limitation of the sheets, each of them embracing a surface lying between 4 degrees of latitude and 6 degrees of longitude, but their arrangement is based upon different parallels and meridians. The English and the French maps use the equator as the initia parallel of the zones of the sheets; the German sheets, however, use the parallel of north. Still greater variety reigns as to the limiting meridians. The English maps use as the initial meridian for the columns of the sheets that of Greenwich; the German that of 4 east latitude; the French that of Paris. The French sheets of China do not therefore correspond to the German sheets of China, and if the Indian map be executed and the French map is extended over larger areas of Asia, as planned, its sheets will overlap the Indian sheets. Thus much double work will be done and the English and French maps can not be directly joined. The same trouble will happen with the English and German maps. We have in the English, French, and German maps not sheets of *one* map, but sheets of different maps, though each of these maps realizes the advantages of a map of the world.

In execution the different maps are based on the same principles that are proposed for a map of the world and now in general use. Water is represented blue, mountains by brown or gray shading or sketched contour lines; names and some ways of communication black, on the German and the French map partly red. But there are differences in the adopted signs for towns and in the style of lettering the names, though each separates duly the names of rivers, mountains, and townships by the character of the lettering. Greater differences exist in the measures adopted for height indications; the German and French maps use the meter, the English the foot. The greatest differences, however, lie in the orthography of names and in the fact that we see on the several series of sheets geographical terms in different languages. In all these respects the maps stand on a national and not on an international basis, and do not show that uniformity which one might wish for a map of the world. But it must be admitted that in many of these respects strong uniformity can be reached. The state of our geographical knowledge does not allow us to represent all countries with the same degree of accuracy; there can not be perfect uniformity in their representation; there will always necessarily be a certain liberty of representing unlike phenomena. The orthography used by the civilized nations being different, there can be no uniform orthography of geographical names, and the international orthography must depend for all those countries which use the Latin alphabet on a national base. Uniformity can only be reached as to a scale, as to the projection

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States, the topographical maps, with their brown contour lines, blue rivers and lakes, should be followed ; for South America and the extreme north and south of North America the representation by hill-shading would be sufficient. But the map should not be confined to land ; it should represent also the bottom of the bordering seas, as is done by the French map, and the inland lakes, for which sufficient soundings already exist. Geographical orthography presents for America no difficulties, for only three languages are officially adopted in the different countries—English, Spanish, and Portuguese. They afford the standard for writing geographical names ; Indian names must be given in that form which is usual in the several countries. Thus on this point uniformity could be more easily reached than in other parts of the world.

The Geographical Congress may be proud to have advanced by its resolutions in former meetings the execution of three great maps, which will cover one-third of all land. It should recognize, however, the work done by those countries which have acted in the essential points and acted upon its resolutions. It should thank the Geographical Service of the French Army at Paris, the Orthographical Department of the Prussian Survey at Berlin, and the Intelligence Division of the War Office at London, and it should extend the general knowledge of these maps by calling special attention to them. The Congress should invite the above-named offices to give an account of their work, accompanied, if it is possible, by parts of the maps in a supplement to its report. But it seems to be especially appropriate that the first Geographical Congress held in this country should take the first steps toward a general map of America. Thus to the third part of a map of the world, which is now practically in the way of execution, it would add the map of another third of the world. If in this way two-thirds of a general map of the world are started, the completion of the rest of the map can not fail.

METHODS OF EXPLORATION IN AFRICA

BY MAJOR A. ST. H. GIBBONS, OF THE ROYAL GEOGRAPHICAL SOCIETY OF LONDON

In his explorations in Africa Major Gibbons has traversed about 22,000 miles. This is more than seven times the distance from New York to San Francisco, and is probably the record for African travel. What makes the distance all the more remarkable is that the routes were not hurried over, but every mile was accurately and systematically observed. Major Gibbons has crossed Africa from the Cape to Cairo, and also from the mouth of the Zambezi to Benguela. He is the author of "Africa from South to North through Marotseland," just published in two handsome volumes by John Lane, of New York and London.

FEW problems are incapable of solution by more than a single method, and such is the constitution of human judgment that opinion is usually divided as to the best means of attaining any given object.

In the case of opinions founded on hypothesis as distinguished from those based on positive data, it is seldom that a public verdict—even though arrived at by an overwhelming majority—can be definitely accepted as final, for the opin-

ion of a community, and, in fact, of the world at large, is constantly subject to modification, sometimes for reasons obvious to all, sometimes as a result of influences more subtle and obscure.

Such being the case, I recommend to the consideration of the Congress a principle which I submit is inseparably wrapped up with the best interests of geographical research in the Africa of today—a principle which hitherto has received but little attention at the hands of geographers at large, and still less, if any at all, by the general public.

In the school days of most of us an intelligent boy could acquire in a few hours all that was to be learned from the map of Africa—a huge yellow continent fringed by a coast-line, on which alone was to be found any information of a definite nature. The life-long labors, the enthusiasm, and the splendid successes of David Livingstone were already awakening throughout the world a latent interest in a continent the interior of which was better known in the days of Ptolemy than during the boyhood of our own fathers.

The development of a great and attractive idea is seldom allowed to lapse with the life of the initiator.

Thus the career of Livingstone sowed the seeds of other careers and added to the history of progressive civilization illustrious names which will retain their luster until the world forgets the meaning of the word manhood. The last of this first generation of eminent modern explorers died only a few months ago, and has left on record a career scarcely less remarkable for obstacles met and overcome than for the importance of the political and geographical results springing from it.

The exploration of an unknown continent, such as was Africa two generations ago, must necessarily proceed by stages. First, the main features of the continent must be discovered—its general physical construction, the main river systems, the character of the inhabitants, and so forth. In fact, a *general* knowledge of what the continent contains must be acquired. To attain this object it is necessary that expeditions should dive deep into the depths of the unknown, should draw on the map long lines which will intersect what may be described as the main skeleton and arteries of the body to be constructed.

With Stanley's last great trip across the continent this stage was practically developed, and the time had arrived when, in my humble opinion, the second stage was ripe for development, when the smaller bones, the veins, and the tissues should be pieced into the skeleton already constructed.

While fully acknowledging the valuable results derived from the accumulated labors of more recent African explorers, I submit that had geographers in general realized twenty years ago that it was time for generalization to give place to specialization—in other words, had recent exploration been directed more toward detailed research in specially selected areas and less toward what is, after all, little more than the construction of glorified route maps, the world's knowledge of Africa would today be more complete and more accurate than it is. It follows that to the traveler the former plan of campaign presents advantages which are denied the latter. An imposing journey from coast to coast is unquestionably of great personal and general interest. In passing rapidly from tribe to tribe and through various districts, the most difficult to please will not complain of monotony or lack of interesting experience. Latitudinal positions may be fixed with accuracy, longitudes less definitely. A more or less sketchy account of the many peoples encountered may be entered in the diary and a general idea of various local characteristics may be acquired, but these are more in the nature of first impressions, and, as the many conflicting ideas gleaned by different travelers in

one and the same district tend to show, are not always quite reliable, and it is sometimes difficult to determine what to accept and what to discard.

Compare with work done on this principle the result of routes equally long which have been followed within a circumscribed area—a single country, so to speak. To begin with, the time during which the explorer has been in touch with one and the same tribe will be calculated in months instead of days. If he is experienced in native character and methods, he will have gained the confidence of the people; he will have picked scores of brains on every subject on which he is in search of knowledge. From the outset he will have been learning facts and unlearning fiction. Having based his plans on hearsay information, he will have visited places of special interest; will have so arranged his routes as to enable him to fix cardinal points, to enter in detail the courses of important rivers, their sources, and those of many of their tributaries. The larger affluents will have been crossed and recrossed at such intervals as will have enabled him to determine their mean direction. The boundaries of tribes and subtribes will have been similarly treated, and the many crossings of routes and independent connections with the base will have supplied checks and counterchecks of the greatest value. The result should be a map which will stand the test of time. In addition to this, even if the explorer is not an all-round specialist, he will have collected as much data as will supply food for thought to the ethnologist, the naturalist, the botanist, and the geologist, and I venture to think he will, on his return home, be struck with the meagerness of the knowledge acquired during his journeys to and fro as compared with what he has learned in the objective country.

To efficiency in this case must be added economy, for once arrived at the base, there is no longer need to carry about more supplies than are required for the few months or weeks during which each subsidiary expedition is at work. Thus if the same caravan used for the conveyance of supplies from the coast or railway terminus is indispensable for the return journey it can be split up into as many small caravans as there are officers in the expedition, and these can work separately along preconcerted routes. If other means for the return journey are available, the bulk of the porters may be returned to their homes, and the local native—usually a much cheaper article—may be employed as necessity demands.

In conclusion, I would respectfully venture to remind the representatives of the many geographical societies assembled here in Congress that the choice of method in this direction is largely in their hands. The would-be explorer will very naturally prefer to proceed on popular lines, and will look for advice to those scientific experts in whose hands his work will ultimately be placed. If the Geographical Societies of Europe and America prefer to popularize the system recommended in this paper, the future explorer will more often work on these lines. If otherwise, reform in this direction will be less rapid and deferred.

THE SPECIAL TELEGRAPHIC TIME SIGNAL FROM THE NAVAL OBSERVATORY

In Honor of the Eighth International Geographic Congress, Including the Greeting Sent by the Congress to the Nations of the World and Their Replies

An interesting incident of the reception at the Naval Observatory to the Eighth International Geographic Congress on the evening of September 8, 1904, was the sending of a special telegraphic time signal according to the plan followed daily at noon, but ending at midnight.

At the close of the reception as many of the members of the Congress as could do so waited in the large rooms of the Department of Chronometers and Time Service, while the rest of the visitors took stations on the lawn outside the open windows. Promptly at 5 minutes of 12 the current was turned on by Hon. Paul Morton, the Secretary of the Navy, all the connecting circuits having previously been closed, and the transmitting clock at once began to send out a click over the wires at every swing of the pendulum, with the usual omissions of one second at each half minute and five seconds at the end of each minute up to the last minute, when there is a break of ten seconds, followed by the click indicating the exact instant of midnight.

Through the voluntary coöperation of the Western Union and Postal Telegraph Companies and the American Telephone and Telegraph Co. and their connecting lines, the entire series of signals was transmitted not only throughout the United States, but very far beyond its limits. In fact, a report received on the following day from Adelaide, Australia, showed that the signals had met at that distant point one series coming from the east via Vancouver, Fiji, and Norfolk Island and the other from the west via the Azores, Lisbon, Gibraltar, Suez, Aden, Bombay, Madras, and Singapore.

These time signals were followed by a brief message from the Congress to the nations of the world, as follows:

"The Eighth International Geographic Congress, now in session in Washington, sends with this midnight signal from the Naval Observatory its greeting to the nations of the world, through the courtesy of the various telegraph and cable companies."

Those who waited a few minutes after 12 had the pleasure of reading a few early messages that were received in reply, while many other messages were received later and were read at the meeting of the Congress on the following day.

This plan was carried out so successfully only through the energetic voluntary coöperation of the telegraph and cable companies, to whom the success of this interesting feature of the reception of the Congress in the nation's capital was largely due.

The following interesting extracts from letters and telegrams have been furnished by Rear Admiral C. M. Chester, U. S. N., Superintendent of the Naval Observatory. The record is very impressive as indicating the perfection of a system by means of which the Naval Observatory clock can be practically heard around the world and a message from the Congress delivered

and acknowledged within a very few minutes from points as far away as Adelaide, Guam, and Mauritius.

PRELIMINARY ARRANGEMENTS

Western Union Telegraph Co.: Full instructions have been given covering general distribution of the special midnight time signal tonight and the exchange of messages with the Naval Observatory relating thereto. Direct connection has been arranged with the Tacubaya Observatory, Mexico City, the Cordoba Observatory, Argentina, and the Greenwich Observatory, England. The British Post Office Department has arranged for a direct wire between London and Rome, over which the signal will be sent to the Royal Observatory. The Great Northwestern Telegraph Co. has arranged to make the desired distribution in Canada, as has the Great Northern Telegraph Co., which is our connection for Sweden, Denmark, Russia, etc., and efforts are being made to have the Russian Telegraph Administration continue the distribution. The Eastern Telegraph Co. promises distribution over its lines and that company's coöperation in endeavoring to get the several continental administrations to distribute the signals.

Postal Telegraph and Commercial Cable Co.: We shall be glad to transmit the time signals and final message over our Pacific system to Manila. Will depute an operator to be in attendance at the Observatory at Washington for this purpose. Cable companies beyond London say with regret that they can not undertake transmission.

Central and South American Telegraph Co.: I have yours of August 31, and take great pleasure in forwarding same to our Galveston manager, with instructions to act on the night stated, September 8, in accordance with your request.

Telegraph Department, Canadian Pacific Railway Co.: Shall be very pleased to assist by transmitting time signals over the entire telegraph system of the Canadian Pacific Railway, and have wired Superintendent British Pacific Cable requesting that signals be forwarded over that system. A similar request has been made to the Superintendent of the Halifax and Bermudas and Direct West India Cable Co. We will also forward the signals from Vancouver to such stations as can be reached in Alaska.

Government Telegraph Service, Dominion of Canada: With view to complying with your request, have telegraphed Superintendent Yukon Telegraph, Vancouver, to make arrangements for transmission of time signals midnight Thursday, eighth instant. . . . Earnest congratulations upon the success that has attended your efforts in the demonstration of a world-wide coöperative signaling system.

Chief Signal Officer, U. S. Army: Have instructed the Signal Officer, Department of the Columbia, Seattle, Washington, to extend such courtesy to your service as may be practicable in transmitting the signals over the Seattle-Alaskan cable and lines of military telegraph in Alaska.

Hydrographer to the Bureau of Equipment, Navy Department: Copies of your letter have been forwarded to all of the branch hydrographic offices with direction that, if possible, they will observe the time signals and report the results.

TELEGRAMS RECEIVED IN REPLY

President Diaz, of Mexico, per Western Union Telegraph Co.: I respond with thanks to your generous salutation, and shall see you with pleasure when you come to Mexico.

President Francis, of the Louisiana Purchase Exposition, St. Louis, Mo., per Western Union Telegraph Co.: The time signals and message of greeting from the Congress are received during a reception to the international jury of awards. The officers and the interna-

tional jurors of the world's greatest exposition send cordial greetings to the International Geographic Congress in this its first session on the western hemisphere, and assure the Congress that it will be heartily welcome on September 19. The President of the National Geographic Society and other scientific men here present, including 1,000 jurors of international repute, join in thus greeting your distinguished body.

Adelaide Observatory, Australia, per Western Union Telegraph Co.: Your greetings gladly received and heartily reciprocated. Signals received, the last being at 2:41:33, Adelaide standard time, 9 hours 30 minutes east of Greenwich. (Interval, 11 minutes, 33 seconds.)

Adelaide Observatory, Australia, per Postal Telegraph Co.: Your greetings gladly received and heartily reciprocated. Signals received very erratic, the last being at 2 hours, 30 minutes, 14 seconds, Adelaide standard time, 9 hours and 30 minutes east of Greenwich. Also received signals via Eastern. (Interval, 14 seconds.)

Melbourne Observatory, Australia, per Western Union Telegraph Co.: Last signal received 3 hours, 9 minutes, no seconds. Acknowledge greetings and send best wishes International Congress. (Interval, 9 minutes.)

Sydney Observatory, Australia, per Postal Telegraph Co.: The signals from Washington to Sydney Observatory occupied in transit 2 decimal 25 seconds in reaching here, which was remarkably quick. In January last signals took 3 decimal 5 seconds in coming through.

Wellington Observatory, New Zealand, per Postal Telegraph Co.: Observatory acknowledges and cordially reciprocates kind greetings of Geographical Congress.

Madras Observatory, India, per Western Union Telegraph Co.: The Madras Observatory acknowledges the greeting of the Eighth International Geographical Congress at Washington, sent with their midnight signal, which was received here at 10:21:52.6, Madras mean time, and wishes success to the Congress. (Interval, 53.5 seconds.)

Royal Observatory, Mauritius, per Western Union Telegraph Co.: Message received Friday 9.08 a. m. Mauritius time. In thanking you for your greeting Mauritius prays that your labors may be attended with every success. (Interval, 17 minutes, 47 seconds.)

Royal Observatory, Cape Town, South Africa, per Postal and Western Union Telegraph Cos.: Noon. Success to your enterprise. Last of series of dots received here at 11 hours, 54 minutes, 19 seconds, Washington time. No further signals received here. (Interval, 2 minutes, 35 seconds.)

Astronomer Royal, Greenwich, England, per Western Union Telegraph Co.: Signals satisfactorily received and observed. Compliments to Geographical Congress.

Pulkowa Observatory, Russia, per Western Union Telegraph Co.: The Pulkowa Observatory, with sincerest gratitude, returns its greetings to the Eighth International Geographic Congress and wishes them entire success in their important enterprises.

Royal Observatory, Lisbon, Portugal, per Western Union Telegraph Co.: The Royal Observatory of Lisbon has received the midnight signals from Washington and sends its best greetings to the Geographic Congress and to the world-famous U. S. Naval Observatory with thanks.

Royal Observatory, Madrid, Spain, per Western Union Telegraph Co.: The director of the Royal Observatory receives at 5:2:30 a. m. the greeting of the Congress, and has the honor to state that this scientific center awaits with enthusiasm the results of the meeting. (Interval, 2 minutes, 30 seconds.)

Royal Observatory of Roman College, Rome, Italy, per Western Union Telegraph

Co.: September 9, 6.23 a. m. Last time signal received at 5 hours, 59 minutes, 50 seconds, central European mean time. (10 seconds early.)

Cordoba Observatory, Argentina, per Western Union Telegraph Co.: The astronomers of the Cordoba Observatory have received with sincere pleasure the signals and messages of the International Geographical Congress, and desire to express their hearty sympathy with the objects the Congress has in view. Signal arrived at 12 hours, 43 minutes, 14 seconds, Cordoba time. (Interval, 2 seconds.)

Rio Janeiro Observatory, Brazil, per Western Union Telegraph Co.: Observatory Rio thanks and reciprocates greetings of the Eighth International Geographic Congress with this signal of two twenty-seven Rio time. (Interval, 19 minutes, 41.4 seconds.)

Quito Observatory, Ecuador, per Western Union Telegraph Co.: Signal arrived at 11.47, Quito time. The Director General of Telegraphs and Observatory sends members Geographical Congress salutation and felicitation. (Interval, 2 minutes, 1 second.)

National Observatory of Tacubaya, City of Mexico, per Western Union Telegraph Co.: Received signals 36 hundredths slow and congratulate you on the success of the experiment.

McGill College Observatory, Montreal, Canada, per Western Union Telegraph Co.: Signals as received on our chronograph were 10 hundredths of a second slow of our standard clock signals. Observatory acknowledges and cordially reciprocates kind greetings of Geographical Congress.

Toronto Observatory, Meteorological Service of Canada, per Western Union Telegraph Co.: Your signal received 0.12 of second after the hour by our clock 0.12 slow, which makes your signal 0.23 slow of our calculated time. We observed tonight for time chronograph record.

Naval Governor of Guam, Ladrone Islands, per Postal Telegraph Co.: The American colony and native inhabitants of Guam send thanks for the cheering message of the Eighth International Geographic Congress, at Washington, and invite them to hold their next session in this beautiful and happy island.

Commandant of Naval Station, Honolulu, H. I., per Postal Telegraph Co.: Time signals received, Greenwich time, five hours, no minutes, two and three-tenths seconds. (Interval, 2.3 seconds.)

Commanding Officer, Marine Barracks, Sitka, Alaska, per Western Union Telegraph Co.: Approximate time, seven fifty-eight sixteen and six-tenths, Coast Survey magnetic station. No correction made for retardation of transmission, which is estimated to be quarter second at Seattle office (22.9 seconds early).

Observatory of Harvard University, Cambridge, Mass., per Western Union Telegraph Co.: Signals approximately one-tenth of a second late.

Lick Observatory, Mt. Hamilton, Cal., per Western Union Telegraph Co.: The Lick Observatory sends greeting of cordial good will to the Eighth International Geographic Congress, for the study of geography, like that of astronomy, has for its main purpose advancement of civilization in all lands. Your clock beats preceded ours by 0.24 of a second.

Yerkes Observatory, Williams Bay, Wis., per Western Union Telegraph Co.: The Yerkes Observatory returns the greetings of the International Geographic Congress and wishes every success to the Geographic Society.

Observatory of Princeton University, N. J., per Western Union Telegraph Co.: The Princeton Observatory, now in session, sends its greeting back to the Eighth International Geographic Congress. We are well located and hope other points will soon be equally well known.

Lowell Observatory, Flagstaff, Ariz., per Western Union Telegraph Co.: 10 p. m. The Lowell Observatory gratefully acknowledges the message of greeting from the Eighth Geographic Congress and begs leave to express its appreciation and good wishes for the valuable work done by the Congress for science.

Goodsell Observatory, Northfield, Minn., per Western Union Telegraph Co.: Goodsell Observatory, Northfield, Minn., sends greetings to International Geographical Congress. The Washington time signals came perfectly, and we took the record with our mean-time clock on the chronograph for the 5 minutes. The measured interval was very closely one-tenth of a second, Washington slow, as it should be.

Washburn Observatory, Madison, Wis., per Western Union Telegraph Co.: Greeting from Washburn Observatory; time signal received 10 hours, 59 minutes, 59.7 seconds (interval, 0.3 of a second).

Chamberlain Observatory, Denver, Col., per Western Union Telegraph Co.: The signals were received fairly well, but were somewhat irregular. The result obtained for transmission time is seven-hundredths of a second.

Laws Observatory, Columbia, Mo., per Western Union Telegraph Co.: Special series of time signals were received on the chronograph of this observatory along with signals from our own clock. The midnight signal was registered at 10 hours, 59 minutes, 59.46 seconds, central standard time. (Interval, 0.54 of a second.)

Allegheny Observatory, Allegheny, Pa., per Western Union Telegraph Co.: The signals from your observatory were recorded on our chronograph 0.42 of a second later than our own signals.

Observatory of Mare Island Navy Yard, Cal., per Western Union Telegraph Co.: Time was received at Mare Island thirty-two-hundredths of a second early.

Branch Hydrographic Office, New York, N. Y., per Western Union Telegraph Co.: Time signals received O K at New York.

It may be added that the reported receipt in some cases of the time signals at a time earlier than when they started, probably means that the latter portion of the 5-minute series of signals failed to get through the telegraphs or cables, so that the final signal received started earlier than midnight.

RESOLUTIONS ADOPTED BY THE EIGHTH INTERNATIONAL GEOGRAPHIC CONGRESS, SEPTEMBER, 1904

MAPS ON SCALE OF 1 : 1,000,000

TWO resolutions introduced by Dr Albrecht Penck, of Vienna:

1. The Eighth International Geographic Congress at Washington presents its thanks to the Service Geographique de l'Armée à Paris, to the Kartographische Abteilung der Königlisch-Preussichen Landsaufnahme, in Berlin, and to the Intelligence Division of the War Office at London for having commenced the publication of large maps on the scale of 1 : 1,000,000, which correspond in a general way to the maps of the world, proposed by the Congress at Berne, and it invites these offices to prepare an account of their maps, accompanied, if possible, by parts of them, for publication in the report of the Washington meeting.

2. The Congress proposes to the government of the United States the execution of a general map of America on the scale of 1 : 1,000,000, similar to the maps on the same scale of Asia, China, and Africa, now in preparation by the Service Geographique de l'Armée à Paris, by the Königlisch - Preussiche Landsaufnahme, in Berlin, and by the Intelligence Division of the War Office at London, each sheet of the map being projected on its own plane and being limited by parallels 4 degrees apart and meridians 6 degrees apart, the initial meridian for the division being that of Greenwich, the initial parallel the Equator and the standard of measures being the meter.

POLAR EXPLORATION

The following resolution introduced by Sir John Murray:

The Eighth International Geographic Congress, realizing that the only untouched fields for geographical discovery are the regions immediately surrounding the poles of the earth, desires to place on record its sense of the importance of forthwith completing the systematic exploration of the polar areas. It is very desirable that the experience gained by men of science and officers in the recent Antarctic expeditions should be turned to account by following up without delay the successes they have obtained. The Congress recognizes that the Arctic regions possess a more immediate interest for the people of North America and expresses the confident hope that the expeditions now being prepared will be so supported as to secure early and complete success.

EARTHQUAKE INVESTIGATION

The formation of the International Seismological Association has accomplished the wishes of the Seventh Congress in this respect: The Eighth International Congress sends its congratulations to the International Seismological Association, whose further work is awaited with great interest.

DEEP-SEA MAPS AND NOMENCLATURE OF THE EARTH'S BOTTOM

The Eighth International Geographic Congress expresses its thanks to His Serene Highness, the Prince of Monaco, for having executed the map of the ocean, the execution of which was desired by the Congress of Berlin, and expresses especially its agreement with the chosen scale and projection, with the adoption of the meridian of Greenwich as initial, and with the adoption of the meter for indication of the depths, and the principle of the system of international submarine terminology used.

RULES FOR GEOGRAPHIC NAMES

Local names are, as far as possible, to be preserved not only in those regions where this is already an established principle, but also in the southern oceans. They should on this account be determined with all the accuracy possible.

Where local names do not exist or can not be determined with safety, the name of the first discoverer is to be applied until further investigation. The arbitrary altering of historical, long-existent names, well known not only in common use but also in science, is to be regarded as extremely reprehensible, and every means should be employed to resist such alterations. Inappropriate and fantastical names are to be replaced, as far as possible, by local and more appropriate names.

The above rules are not to be rigorously construed, yet they should be followed to a greater extent than heretofore by travelers and in scientific works. Their publication in periodicals as the opinion of the Congress will probably prove of great weight. Although in recent years many official systems of determination of geographic names have been enunciated, we have still much evidence of the influence which the wishes

of the International Geographic Congresses exert over the decision of the official authorities. To these geographical societies are urged to give wide publicity.

INTRODUCTION OF THE FRACTIONAL SCALES OF MAPS

The Seventh International Geographic Congress expressed the urgent wish that upon all charts, including those published by those lands still employing the English and Russian systems of measurement, along with the scale of geographic coördinance, the scale of reduction should be expressed in the usual fractional form, 1 : x, and that the latter be added to all lists of charts covering land and sea, and requested the Executive Committee of the Congress to bring this decision to the attention of all governments, geographical societies, and establishments engaged in the publication of charts.

The advantage to be derived from the support of this resolution, which had its origin with the editor of Peterman's *Mitteilungen*, and the extensive dissemination of the resolution is at once evident. In English publications a custom has arisen of adding a statement of the ratio 1 : x to the usually employed x miles to one inch. In America the custom has arisen of going even a step beyond this, namely, the addition of the ratio of reduction has led to the direct application of the decimal system in the units of measure adopted upon the chart.

To this geographical societies are urged to give wide publicity. This resolution of the Seventh Congress is reaffirmed.

THE DECIMAL SYSTEM

The Seventh International Geographic Congress expresses itself in favor of using a uniform system in all geographical researches and discussions, and it recommends for this purpose the employment of the metric system of weights and measures, as also the employment of the centigrade thermometric scale.

It is at least highly desirable that there should always be added to the introductions of the Fahrenheit scale and to the Reaumur scale their equivalent upon the scale of Celsius. Similarly, the revived activity in this question, which reaches even more deeply than the former into the well established customs of daily life, has proved that the Congress is not without value in promoting international uniformity and simplicity. Although the metric system of weights and measures has made slow progress, and this alone through the portals of scientific work, its application to geophysics and geography has already made a fair beginning. In England a special organization entitled the Decimal Association has taken charge of the matter. The Commonwealth of Australia has entrusted the subject to a commission. We are without knowledge of the efforts in this direction thus far made in Russia. Geographical societies are urged to give wide publicity to this resolution. These resolutions are reaffirmed by the Eighth International Geographic Congress.

COLLECTION OF RECORDS OF DRIFT ICE

This work is progressing satisfactorily in charge of the Danish Meteorological Institute, with the coöperation of various national offices. The Eighth International Geographic Congress expresses its thanks to the Danish Meteorological Institute and the coöperating offices for their systematic collection of records of drift ice.

STATISTICS OF POPULATION IN COUNTRIES WITHOUT CENSUS

The following resolution was introduced by the Hon. Carroll D. Wright, the U. S. Commissioner of Labor, and was agreed to :

Moved that a committee of five be

appointed by the President to confer with a committee of the International Statistical Institute on methods of obtaining the population in countries taking no census.

STANDARD TIME

The following resolution, introduced by E. E. Hayden, was adopted:

Resolved, In view of the fact that a large majority of the nations of the world have already adopted systems of standard time based upon the meridian of Greenwich as prime meridian, that this Congress is in favor of the universal adoption of the meridian of Greenwich as the basis of all systems of standard time.

PUBLICATION OF PHOTOGRAPHS

The following suggestion, introduced by Dr Albrecht Penck, was adopted:

It is suggested by the lantern slides shown by Mr Siebers and by the photographs by Mr Willis that it is desirable that in these and the cases of other exploring travelers photographs of geographical significance might be published, and accompanied by short explanatory notes, so that they may form collections of representative physical features of different parts of the world.

THE NINTH CONGRESS

The invitation extended by the Government of Switzerland and the Geographical Society of Geneva to hold the Ninth International Geographic Congress at Geneva in 1908 was accepted.

CARTOGRAPHICAL ASSOCIATION

The following resolution, introduced by Dr Albrecht Penck, was adopted:

The Congress refers the proposition of Mr Schokalsky and the paper of Mr Schrader to the committee appointed at the Congress of Berlin concerning the Cartographical Association. This committee is requested to report on the necessity of a Cartographical Association to the next Congress. In the meantime the committee might interest geographical societies in the plan and in the necessity of dealing with maps in geographical journals in a more detailed way than is now usual, and in showing that the general use of maps should be popularized and extended by instruction in schools, and the commerce with maps should be better organized.

The committee being now reduced by the death of General Titto and the withdrawal of General Heinmek in favor of Mr Schrader, the Congress appoints the following gentlemen to the committee:

Mr Franz Schrader, Paris.
Jules de Schokalsky, St Petersburg
Professor Oberhummer, Vienna.
Mr Gannett, Washington.
Mr Bartholomew, Edinburgh.

The committee was appointed, and Mr Gannett was designated as chairman.

EIGHTH INTERNATIONAL GEOGRAPHIC CONGRESS

THE Eighth International Geographic Congress was formally opened by Commander R. E. Peary, President of the Congress, Thursday morning, September 8, in the large hall of George Washington University. Hon. Charles D. Walcott, as the personal representative of President Roosevelt, welcomed the Congress to the United States.

Mr Walcott, in his brief remarks, emphasized the fact that the practical side of geographical science had been specially followed in this country:

"We have, with our Canadian and Mexican neighbors, a large country, containing a great variety of geographic features, and in the work of making it a fit place of abode for the American people geographic factors have had much influence. Hence the study of our own geography has had a practical bearing, as well as a theoretical interest to us, and it has received much attention.

"Recent events, moreover, have intensified the interest of the American people in geography and expanded the field of their study to the limits of the earth. The United States has recently been placed in a position involving widespread duties and responsibilities. While other countries have for generations borne the burden of policing the remoter parts of the earth, this country has until recently taken little part in those labors.

"The expansion of the country has increased the geographic knowledge of the mass of the people, for the country's welfare holds the attention of every citizen. Our interests in the Philippines have quickened our thought concerning the problems of all the East. While all aspects of geography have had a great revival among us, we are, perhaps, especially and most directly concerned with the commercial aspects of the science."

Dr G. K. Gilbert, Acting President of the National Geographic Society, welcomed the Congress on behalf of the Society.

"Your visit to our land finds us in the midst of a period of exceptional growth of geographic interest. As you have just been told in the message brought by Dr Walcott from the President of the United States, our geographic outlook as a nation has been revolutionized by the recent acquisition of a number of insular dependencies. While our people as individuals are divided in opinion as to the advantage of that acquisition, we are of one mind in accepting the responsibility involved and in recognizing the need of a colonial policy and a colonial system. With that acceptance and that recognition comes a new need for broad geographic knowledge, and the nation is eager, as never before, for information on a wide range of geographic subjects and an important array of geographic problems.

"In the field of physical geography we have long been active, and we have felt that we were measurably in touch with the geographic scholars of other lands, but in the geography of countries, in the geography of industries, and in the geographic problems of administration we are the merest tyros. And now that you, the geographers of the Old World, have come to our shores, we are eager to listen to all that you have to tell us.

"The National Geographic Society, having its home at the seat of government, and including in its membership the official geographers of the nation, is peculiarly appreciative of the opportunities afforded by this occasion, is peculiarly grateful that you have consented to favor us by your presence. On behalf of that society I offer you a hearty welcome to our land and to our city."

By direction of the Congress the following telegram was then sent to President Roosevelt at Oyster Bay:

"The President:

"The Eighth International Geographic Congress, now in session in Washington, returns hearty thanks for your welcome, presented in the speech by your representative, Dr Walcott."

The telegram was signed by Commander Peary as President and Mr Henry Gannett as Secretary of the Congress.

M. Henri Cordier, President of the Société de Géographie of Paris, delegate of the French government, responded to the addresses of welcome on behalf of the government representatives. Prof. Albrecht Penck, of Vienna, responded on behalf of the geographical institutions, and Dr Yule Oldham, of England, on behalf of the geographical societies. President Peary then delivered his address as president, printed in the earlier pages of this magazine.

The report of the executive committee of the Seventh International Congress, transmitted by Baron Richthofen, president of that congress, was presented by Prof. Oberhummer of the University of Vienna. Baron Richthofen expressed in a letter his disappointment at not being able to attend the Eighth Congress.

Commander Peary next presented the Swiss Minister, who in turn introduced Prof. de Claparede, President of the Geographical Society of Geneva and the delegate of the Swiss government. On behalf of his government, Prof. de Claparede extended to the Congress a most cordial invitation to hold its ninth session in Geneva in 1908, that year being the fiftieth anniversary of the founding of the Geographical Society of Geneva.

Prof. Bela Erodi, of Budapest, representative of the Hungarian government, was introduced, and extended an invitation in behalf of his government and the Royal Geographic Society of Hungary to hold the Ninth Congress in Budapest.

It is impossible in this limited space to enumerate the 250 scientific papers presented at the various sessions of the Congress. Several of them are published in this number, and also abstracts of a number of others. Additional papers and abstracts will be published in succeeding numbers of this Magazine.

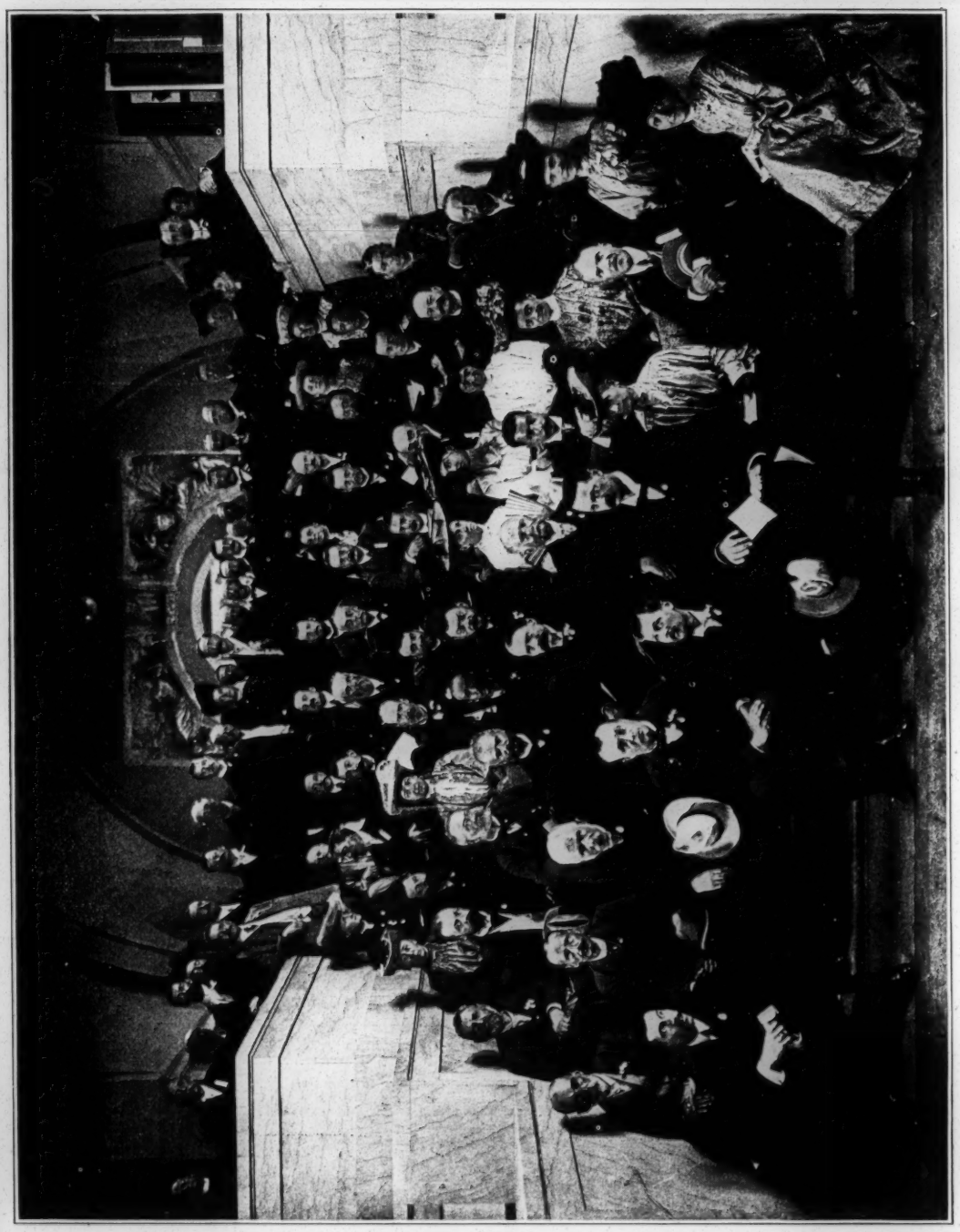
The social sessions of the Congress in Washington included an informal reception at the home of the National Geographic Society Wednesday evening, September 7; a reception at the U. S. Naval Observatory by the Secretary of the Navy and Admiral and Mrs Chester (see page 411) Thursday evening; a reception at "Twin Oaks" by Mrs Gardiner Greene Hubbard Friday afternoon, and a lecture Friday evening by Charles M. Pepper on "The Bolivian Andes"; a reception by Commander and Mrs Peary Saturday evening, and on Sunday a trip down the Potomac as guests of the National Geographic Society on special steamers to Mount Vernon, which, through the courtesy of the directors of the Mount Vernon Association, was specially opened on Sunday for the Congress.

Sunday evening, September 11, the Congress took a special train to Philadelphia, where they were welcomed by the Geographical Society of Philadelphia and handsomely entertained during Monday. In the morning Independence Hall and the Commercial Museum were visited. A luncheon was tendered the Congress at Houston Hall by the University of Pennsylvania, after which they were driven in tallyhos through the magnificent Fairmount Park and Wissahickon Drive, being personally conducted by President Bryant, Dr Angelo Heilprin, Dr Talcott Williams, and members of the Philadelphia Society. In the evening the Geographical Society of Philadelphia gave a dinner to the Congress at the

Some of the members of the Eighth International Geographic Congress

Grouped on the steps of the Treasury Building, Washington, September 10, 1904

Photo by Buck



A group of the Eighth International Geographic Congress

Taken in the Free Academy of Arts and Sciences, Philadelphia, September 13, 1904

Photo by William H. Rau

Philadelphia Country Club. President Henry G. Bryant presided and introduced those answering toasts, who were: Count von Pfeil for Germany, Dr Hugh Robert Mill for England, Henri Cordier for France, Mr Hioki, First Secretary of the Japanese Legation, for Japan, and Dr Bela Erodi for Hungary. After the dinner the Congress proceeded to New York by special train.

At New York the Congress was hospitably received by the American Geographical Society, the members of which did their best to give the visitors a good time. Several scientific sessions for the reading of papers were held. A reception was given by the American Geographical Society at its home Tuesday evening and a subscription dinner in honor of the foreign delegates Wednesday evening. On both days the American Museum of Natural History entertained the Congress at luncheon. On Thursday the Congress were the guests of the American Geographical Society on a trip up the Hudson by special steamer to Fishkill and West Point. The day was perfect. The air had been cleared by a heavy rain the night before, so that the magnificent scenery of the Highlands appeared in majestic distinctness and beauty. At Fishkill the party disembarked and proceeded by trolley to the top of Mount Beacon. Here Dr William M. Davis gave an instructive description and explanation of the landscape.

"Like the lower Potomac, the Hudson below Albany is not a normal river; its volume is not determined by the amount of rainfall upon its drainage basin, but by the depth at which its bed stands beneath sea-level. The present depth of the Hudson River bed below sea-level has ordinarily been explained by a depression of the land; but since it has been recognized that glaciers can erode below sea-level, it is difficult to say how much of the depth of the channel is due to depression of the land and how much to erosion by ice. The extension of a navigable tide-water channel nearly 150 miles northward up the Hudson to Albany, and the opening of the Mohawk Valley west of Albany, between the Catskill and the Adirondack mountains, has made communication easy between the harbor of New York and the prairies of the West. The contrast between the Hudson and the Potomac in this respect is very striking. The gorge of the Highlands is therefore a path of most active traffic, by rail as well as by boat; and New York is for this reason the commercial metropolis of the United States."

From Fishkill the party returned to West Point, whence their special train carried them to Niagara Falls, arriving there Friday morning, September 16. The early part of the day was passed in examining the falls. At 11 a. m. the Congress assembled in the local theater to hear Dr G. K. Gilbert deliver a suggestive address on "the Physical Geography of the Falls and Cataract." The cataract as a thing of beauty is doomed, for the water is being fast appropriated for power. About 3 per cent of the water is now used, and when the plans now in course of construction are completed this will be increased to 10 per cent. It is estimated that 5,000,000 horsepower are easily available. The average yearly retreat of the Horseshoe Falls is from 4 to 5 feet; the American Falls are not retreating appreciably. Before many decades have passed the retreat of the Horseshoe Falls will cut off the water from the American Falls, so that the latter will cease to exist. The gradual tilting of the lake region will some 3,500 years hence cause the waters of Lake Erie and of all the lakes to flow into the Illinois River and thence into the Mississippi. Niagara Falls and Chicago will then disappear.

In the afternoon the Congress took a three-hour trolley ride around the falls and cataract, being personally conducted by Dr Gilbert, Dr Davis, and Dr Penck.

The Congress reached Chicago on the morning of Saturday, September 17,

and were there entertained by the Geographical Society of Chicago. In the morning, sessions were held in Kent Theater of the University of Chicago, according to the following program :

Address of welcome by President W. R. Harper, University of Chicago.

Response by Commander R. E. Peary, President of the Congress.

"The Last Uplift of the Alps," by Dr Albrecht Penck, of Vienna.

"Madagascar," by M. Guillaume Grandidier, of Paris.

"Geographic Elements," by Dr Hugh Robert Mill, of London.

"Physical Geography of Chicago," by Dr Rollin D. Salisbury, of the University of Chicago.

"Economic Geography of Chicago," by Dr J. Paul Goode, of the University of Chicago.

A buffet luncheon was served at Hutchinson Commons, at 1 o'clock, complimentary to members of the Congress.

In the afternoon, the members of the Congress were given a coach ride through Jackson and Washington Parks, stopping for a brief visit to the Field Columbian Museum, and down Grand and Michigan Boulevards, back to their headquarters at Hotel Stratford.

In the evening a reception was given the Congress at the building of the Chicago Historical Society at 8 o'clock. Mr Franklin H. Head, President of the Chicago Historical Society, gave a brief address on Salient Points in the History of Chicago.

The Congress left Chicago by their special train Sunday morning en route for St Louis. A stop for two hours was made at Vernon, so that the party might inspect the coal mine of the Madison Coal Company. Several sessions were held in St Louis in conjunction with the Congress of Arts and Science. The concluding event was a lecture by President Peary in Festival Hall, Thursday evening, September 22, where, before an audience of 4,000 people, he described some of his Arctic experiences and the plans of his next expedition.

Comparisons of the Eighth with preceding Congresses are not necessary, but it can be said with appropriateness that in the number, importance, and character of the papers presented, the Eighth holds a record. As had been expected, the membership of the Congress was not as large as that of the preceding Congresses in Europe, where geographical study is more distinct from other sciences than it is in America ; but of the 800 registered members about 500 were in attendance. About 115 had come thousands of miles, from nearly every country of Europe, South America, and Asia.

The very meeting places of the Eighth were one succession of object lessons in geography. Washington, the greatest laboratory of geographic work in the Western Hemisphere, if not in the entire world ; Philadelphia, the birthplace of the American nation ; New York, the greatest port on the Atlantic seaboard ; West Point and the Highlands, far famed for their natural beauty; Niagara Falls, one of the natural wonders of the earth ; Chicago, the marvelous inland seaport and railroad center, and finally St. Louis, the center of a system of rivers which have a navigable length of 16,000 miles and drain a territory of 1,200,000 square miles of unsurpassed richness.

Many projects were discussed. Some of them in another age might be deemed fantastic, as, for instance, Mr Lobel's plan of a Siberian-Alaskan railroad tunneling the Bering Strait ; but not many years ago if some one had proposed to send a message round the world as Admiral Chester sent the greetings of the Congress September 9, he would have been called demented. And yet the world greeting of the Congress was despatched so simply, and the replies came so instantaneously, that probably few of the large gathering at the Naval Observatory realized what a remarkable

feat was being performed, or appreciated what tremendous geographic obstacles had been overcome by man to make the practically perfect geographic unity of today.

PEARY'S PLANS FOR 1905–06.

In New York, at the subscription dinner given by the American Geographical Society of that city to the foreign delegates, Commander Peary aroused tremendous enthusiasm by stating that his North Polar expedition of 1905 was assured, and that the keel of his new ship had just been laid. It was on this occasion that the Gold Medal of the Société de Géographie of Paris was presented to him by Dr Cordier. Speaking of his vessel, Mr Peary said:

"She will, I believe, be the ablest ship that ever pointed her nose inside the Arctic or Antarctic Circle. She will possess such shape as will enable her to rise to the pressure of the ice floes and escape destruction. She will possess such strength of construction as will permit her to stand this pressure without injury. She will possess such features of bow as will enable her to smash ice in her path, and will contain such engine power as will enable her to force her way through the ice. In maximum dimensions, viz, length over all, breadth of beam, and draught, this ship will be of the size of the British Antarctic ship *Discovery;* in displacement she will be somewhat less; in power she will compare with our largest ocean-going tugs.

"My plan of campaign, in a very few words, is to force this ship to the north shores of Grant Land, taking on board at Whale Sound the pick and flower of the Esquimo tribe with whom I have worked and lived so long, to go into winter quarters on that shore, and to start with the earliest returning light on the sledge journey across the central polar pack, utilizing these Esquimos, the people whose heritage is life and work in that very region, entirely for the rank and file of my party.

"Never before has it been in the power of a white man to command the utmost efforts and fullest resources of this little tribe of people as I can do; and that fact will be of inestimable advantage to me.

"But I will not take time with details. Next summer I shall start North again after that on which I have set my heart.

"Shall I win? God knows. I hope and dream and pray that I may. But if I do not, some one else will, and here comes in another feature of polar efforts.

"There is no higher, purer field of rivalry than this Arctic and Antarctic quest.

"If I win, you will have another one of these magnificent tokens for me, and be proud because we are of one blood—the man blood. If I fail, you will try it until some one gets there, and then we shall have one of these for the man who wins, whether he bears the colors of France or England or Germany or Norway or Italy, and shall be proud of him, for we shall know he is a man and come of a nation of men, and that the best man has won."

SEARCH FOR THE LOST ISLAND OF THE PACIFIC.

James D. Hague, of New York, told the story of the search for "the reported island or islands" of the North Pacific Ocean between Hawaii and Panama. He discussed the theory that the United States sloop-of-war *Levant*, which disappeared mysteriously in 1860 on her voyage from Hawaii to Panama, may have been wrecked on an island in this neighborhood, and the possible survival of some of the ship's company. This island is supposed to be about 1,000 to 1,200 miles east-southeast from Hawaii, substantially in a direct line between the Port of Hilo and the Bay of Panama. From time to time in the early part of the nineteenth century whalers reported the existence of an island group between Hawaii and Panama. They even named two of the islands, calling them "New

Island'' and ''Roca Coral.'' Two British warships, with flags for possession purposes, went on a hunt for them in 1837 and before, but found nothing, although they reported some signs indicating that land was near by. In 1899 the *Albatross* was sent by our government to make another search. No islands were found.

''In March, 1902, Capt. Robert T. Lawless, commanding the steamship *Australia*, on his way to San Francisco from Tahiti, reported passing two patches of what no doubt was shoal water.

''This observation did much to revive interest in the question of the existence of islands in that part of the ocean.

''Certain incidental circumstances had led by chance to the revival of the generally forgotten mysterious fate of the United States sloop-of-war *Levant*, which, having sailed on September 18, 1860, from the port of Hilo, Hawaii, for the port of Panama, has never since been heard from, by any trace whatever, unless it be in certain wreckage found on the south shore of Hawaii in June, 1861, there and then identified by local authorities as wreckage from the *Levant*.

''I had the honor to bring the matter to the attention of President Roosevelt in June, 1903, and thereafter, on presentation of the known facts at the Navy Department, the Secretary of the Navy, Mr Moody, determined to send an expedition as soon as one or more suitable vessels could be spared for the service, to settle finally the question of the existence or non-existence of any shoal, reef, or island in the doubtful region.

''The newly built cruiser *Tacoma*, on her trial trip from San Francisco to Honolulu, was ordered to make a detour in that region in the latter part of May of this year. According to the report of her commander, R. F. Nicholson, search for the island was made for four days, during which neither land, shoals, nor signs of land were seen; in fact, the locality was remarkable for the total absence of birds.

''These results throw no light on the mysterious fate of the *Levant*. The ship's company might have landed without the loss of a single life, in which event there might still be some survivors, whose chances of living till now on a fairly habitable and healthy island might and perhaps have been more favorable than elsewhere.

''I may venture to recall the interesting incident that Edward Everett Hale's Philip Nolan, 'The Man Without a Country,' ended his romantic career on the *Levant* on this her last and fatal voyage. There may have been a whole ship's company of men now without a country cast away on this mysterious island nearly forty-four years ago, some of whom may be still watching for a sail. This would, indeed, be a marvelous thing, but it is not beyond the range of possibility. The mutineers of the *Bounty* lived on Pitcairn Island eighteen years before they were found there, and the extreme and solitary isolation of this supposed land would account for the long undiscovered seclusion of the castaways.''

Count Joachim of Pfeil and Klein Ellguth, in speaking on ''the rise and development of the German colonial possessions,'' told how geographers were responsible for some East African colonies.

''Many of the present German possessions were acquired without the consent of the government. In 1884 Dr C. Peters and myself took steerage passage to Zanzibar and went to what is now German East Africa. Our steerage passage was to deceive English and other Europeans. Dr Peters and Dr Juhlke returned to Berlin to persuade the government to assume formal possession of the land we acquired through treaties with native chiefs. I remained in possession. The territory we had acquired was about the size of Germany. Since the area has been doubled.''

GEOGRAPHIC NOTES

PEARL AND TURTLE FARMS IN JAPAN

ONE of the most interesting addresses before the recent Congress of Arts and Sciences was made by Prof. K. Mitsukuri, of the University of Tokyo, on "The Cultivation of Marine and Fresh Water Animals in Japan." The time is fast approaching when the increase of population on the earth and the question of food supply, which must arise as a consequence, will compel us to pay most serious attention to the utilization for this purpose of what has been termed the "watery waste."

For man to overfish and then to wait for the bounty of nature to replenish, or, failing that, to seek new fishing grounds, is an act to be put in the same category with the doings of nomadic people wandering from place to place in search of pasturage. America has foreseen this and is ahead of other nations with her efficient fish commission. Nor is it from the utilitarian point only that more attention is likely to be paid in future to the cultivation of aquatic organisms. We have been apt to forget that animals are living entities and not simply a collection of dead tissues. But we are beginning to realize that animals must be studied living in order to arrive at the correct interpretation of many biological phenomena.

The speaker described the methods of cultivation of various marine and fresh-water organisms practiced in Japan. He first described the successful cultivation of the snapping turtle, which takes in Japan the place occupied by the terrapin in American gastronomy. Turtle farms in Tokyo and elsewhere are now able to raise tens of thousands of these luscious reptiles and to keep the supply constant. Methods and plans of turtle farms were described. The speaker next described the cultivation of the goldfish, which are wonderful, not only for their beauty, but are a source of endless surprises to the scientist. Various breeds were described and their extraordinary peculiarities.

The pearl-oyster farm was also described. In 1890 the speaker suggested to a Mr Mikimoto the desirability of cultivating the pearl-oyster, and also pointed out the possibility of making the pearl-oyster produce pearls by giving artificial stimuli. The idea was taken up with enthusiasm, and the results are beyond expectations. Today the pearl-oyster farm, put on a commercial basis, has millions of pearl-oysters living on the culture grounds, and is able to place annually a large crop of what has been termed "culture pearls" on the market.

THE ZIEGLER POLAR EXPEDITION

THE auxiliary steamer *Frithjof*, of the Ziegler Polar Expedition, in command of W. S. Champ, has returned to Norway after two unsuccessful attempts to reach Franz Josef Land, owing to the almost unprecedented heaviness of the ice. Mr Champ saw no traces of Captain Fiala's party. The latter are amply supplied with provisions, etc.; so that no anxiety is felt on their being compelled to spend a second winter in the north. The *Frithjof* reached latitude 79 degrees 11 seconds, which is within 40 miles of Cape Flora. Mr Champ says in a letter to the National Geographic Society, which it will be remembered has a special representative with the expedition in the person of W. J. Peters, of the U. S. Geological Survey, who is second in command and director of the scientific work of the party:

"In accordance with the plan of the expedition, Mr Fiala was to put down signals for us at this cape (Flora) on his northward voyage last year and again this past spring. It was also included in the plan to send down a light sled

party with full information as to where the *America* wintered and what had been accomplished during the winter and the first part of the spring. Unfortunately, as above stated, we were unable to connect with this party or reach land. A most careful watch was kept aboard the *Frithjof* both night and day for any trace or sign of the expedition, but nothing whatever was found during the entire period which we spent in the ice.

"I have every reason to believe that the *America* reached Franz Josef Land last year, that winter quarters was established, and that the sledge journey was made this spring. Of course, I have no absolute knowledge that such was the case, but am strongly convinced that the original plans have been carried out.

"We have no anxiety as to the welfare of the men other than the natural chances that all explorers take in such a perilous undertaking. The expedition has been thoroughly equipped and has an abundance of food. In addition to what they carried last year, they have additional large stores to fall back upon in case of necessity in several camps or depots in Franz Josef Land Archipelago. In addition to the food, they are thoroughly equipped to kill game, which abound in that country during certain periods of the year.

"All the mail sent to the members of the expedition, and which was carried by the writer, has been placed in hermetically sealed tins and deposited in the Tromsoe Private Bank.

"It is Mr Ziegler's intention to send out a strong vessel next year for the purpose of continuing the work and reaching the members now in the field."

THE CHAGRES RIVER

THE Chief Engineer of the Panama Canal, J. F. Wallace, has announced that the problem of how to handle the waters of the Chagres River has been solved by a party of American engineers, who have found a way of diverting the waters of the Chagres River into the Pacific Ocean. What to do with the turbulent floods of the Chagres River has hitherto been the most perplexing question which confronted the engineers. The most feasible solutions, until now, had been either to build an enormous dam and spillway costing many millions of dollars, and even then not satisfactory, or to dig a channel 600 feet wide and 40 feet deep. Mr. Wallace estimates that by diverting the river to the Pacific by this newly discovered route at least $20,000,000 will be saved over the previous plans.

Mr. Wallace states that the expedition which found the new waterway was led by Engineer George Ehle. Mr. Ehle has been in Panama three or four years. Four months ago he, with a party of young American engineers, most of them just out of college, was sent to explore the headwaters of the Chagres River. They were abandoned in the tropical jungle by their native helpers, and had to carry on their backs the packs that the natives had abandoned. They cut their way foot by foot through the dense tropical growth along the river. They had maps that had been made by the French engineers, but they found rivers where none were indicated on the maps, and found none where they were indicated. About twelve miles from the canal they found a river on the Pacific slope of the mountains not platted on the maps, by which the waters of the Chagres can be carried to the Pacific Ocean.

The Isthmus of Panama.—When the present able sanitary corps which has charge of bettering the health conditions in the isthmus has carried out its plans for the improvement of the canal strip and the cities of Panama and Colon, there is no reason why the isthmus should not be one of the healthiest places in the world, is the opinion of U. S. Minister John Barrett, of Panama, expressed in a recent report. Mr Bar-

rett continues: "As a matter of fact, there has not been during the months of July and August a single uncomfortable night for sleeping, while the average days have not been hotter than those of New York and Washington. There has been hardly a single instance of serious illness among the considerable number of young men employed here in work connected with the canal, while the percentage of sickness among the larger group of laborers employed at Culebra is not greater than among those engaged in similar excavating work in the United States. Among the 400 marines located half way across the isthmus, at Empire, there has not been a single death from local diseases, while the percentage of those in the hospital is not larger than would be found at the average post in the United States. There has not been a single case of yellow fever for over a month, and there is less malaria than is often found in sections of the United States. The worst portions of the cities of Panama and Colon are much cleaner and more wholesome than the slums of our North American cities, and are far ahead of the average Asiatic city of the tropics."

The Commercial Importance of the State of New York was aptly summarized in a recent address made by George R. Malby as follows: The value of the annual manufactured products of the Russian Empire, or of Spain, or of Belgium, or of many other European countries is much less than that of New York, while our foreign trade exceeds that of every other country in the world, except Great Britain, France, Germany, and the Netherlands. It is 50 per cent larger than Russia's, three times as great as Canada's, four times as great as Spain's, and more than four times as great as the mighty Empire of Japan.

The bank clearings of the city of New York alone have distanced every continental center, and passed even London itself. Our savings bank resources amount to $1,238,000,000, which is a sum larger than that deposited by the citizens of any country in the world except Germany alone, while the aggregate wealth of only a few of the larger European countries, with many times the population, outranks the Empire State, which has nearly doubled during the past ten years.

Conditions in Manchuria.—Under date of August 15 the American consul, Mr Miller, at Niuchwang, has transmitted to the State Department an interesting report of conditions in Manchuria.

The crops in the Liao Valley bade fair to be first-class, and a bountiful crop would be harvested there and in all of southern Manchuria and in northern China. This made for peace as far as the Chinese were concerned. An important fact is the poor condition of the crops in the Sungari Valley, where the wheat is grown with which the flour mills of Harbin are supplied. These mills were idle, having used up all of last year's crop, and this year's crop was so poor that they can not possibly secure grain enough to operate more than half time. Hence the Russian army must depend for its supplies upon a single line of single-track railway, while heretofore it has been able to gather vast amounts of provisions in forage in the country.

The number of immigrants entering the United States in the fiscal year ending June 30, 1904, was 812,870. This is a larger record than that of any year except 1903, when the total was nearly 55,000 greater. Of Austro-Hungarians there was a decrease of 28,855, of Italians 37,326, of Swedes 18,265, and of Japanese 5,704, while there was an increase of Germans 6,294, of Russians and Finns 9,048, of English 12,407, and of Scotch 4,949. Italy sent over 193,296, Austria-Hungary 177,156, Russian Empire and Finland 145,141, Germany 46,380, and England and Ireland 74,768.

ABSTRACTS OF CONGRESS PAPERS

A PROJECT FOR THE EXPLORATION OF THE ATMOSPHERE OVER THE TROPICAL OCEANS

BY A. LAWRENCE ROTCH, DIRECTOR OF BLUE HILL METEOROLOGICAL OBSERVATORY, MASSACHUSETTS, U. S. A.

In 1901 the writer first demonstrated that kites might be flown from a steam vessel independently of the natural wind, and showed that meteorological data could be obtained in this way under conditions and in places hitherto unexplored. Such a region lies above the equatorial oceans, where we know very little about the thickness of the trade-winds or concerning the direction and force of the superposed anti-trades and where we have no knowledge of the vertical variation of temperature and humidity nor whether there is a sudden change in these elements between the trades and the anti-trades.

Starting from the United States in July, the itinerary of a steamer equipped with kites for atmospheric soundings should be northeast across the Atlantic, then southwest to the Azores and by way of Madeira to Teneriffe; thence with the northeast trades and through the doldrums to the South American coast and against the southeast trades to Ascension, returning by a route somewhat more easterly at first and then more westerly. Soundings in these latitudes up to a height of two or three miles would help to solve some of the most important problems in meteorology and physical geography.

To charter and keep in commission for several months a properly equipped vessel would cost about $20,000, and the writer made an unsuccessful application to the Carnegie Institution for a grant to defray a portion of this expense. The investigation is certain to be undertaken before long, but it ought to be done by Americans, who have developed the kite as a meteorological instrument, and the writer is still hoping to carry out the project which he was the first to propose.

THE BEARING OF PHYSIOGRAPHY UPON SUESS' THEORIES

BY WM. M. DAVIS, HARVARD UNIVERSITY

Suess has announced his conviction that plateaus or horsts gain their altitude with respect to neighboring lower lands, not by their own local uplift, but by the depression of their surroundings. The evidence for this conviction is not a direct demonstration of the depression of the lower lands, but an indirect argument based on the difficulty of accounting for the forces needed to produce local uplifts. In his great work, Das Antlitz der Erde, this distinguished geologist does not directly inquire into the altitude that various plateaus had with respect to sea-level before the occurrence of the displacement by which their present altitude was gained, but it is implied that both the plateau areas and the surrounding areas formerly stood at (or about) the present altitude of the plateaus, and that the depression of the surroundings necessary to leave the plateaus in relief was limited to the neighboring areas of now lower lands.

It appears, however, that many plateaus referred to by Suess were formerly peneplains, and hence that they once stood close to sea-level. It follows that if the present altitude of such plateaus was gained by the depression of their surroundings, then not only the neighboring lower lands, but all the oceans of the world and all their associated low-lands must also have been depressed by the full measure of the altitude gained by the former peneplains. It may be impossible to disprove these wholesale movements of depression, but it is desirable to recognize their areal magnitude Until direct evidence of the occurrence of depression is found it seems more reasonable to regard the present altitude of plateaus that were once peneplains as due to local uplifts, whether in our abundant ignorance of the earth's interior processes we can explain local uplifts or not.

THE CHRONOMETER AND TIME SERVICE OF THE U. S. NAVAL OBSERVATORY AND THE PRESENT STATUS OF STANDARD TIME

BY LIEUT. COMDR. EDWARD EVERETT HAYDEN, U. S. N.

This department of the observatory has charge of all naval chronometers and of the daily telegraphic time signals. There are in all about 700 chronometers used to obtain longitudes of vessels and in ocean and lake surveys. These are tested at the observatory, their errors and rates being ascertained by astronomical observations with a transit instrument in connection with standard clocks and chronographs and a temperature room in which continuous high, medium, and low temperatures can be maintained. Telegraphic time signals are sent out at noon daily, except Sundays and holidays, and transmitted throughout the country by the telegraph and telephone companies without cost to the government or to the people. A special New Year's eve time signal sent out on December 31, 1903, traversed some

300,000 miles of wire. It reached Greenwich, England, in 1.33 seconds; the City of Mexico in 0.11; Lick Observatory, California, in 0.05; Sydney, Australia, in 3.50, and Wellington, New Zealand, in 4.00. The United States adopted standard time on November 18, 1883, and thus did away forever with the confusion incident to the use of local mean time. The hour meridians used are 75°, 90°, 105°, and 120° west from Greenwich, designated respectively as eastern, central, mountain, and Pacific standard time. The same system has been adopted in our insular possessions and Alaska It is in use also in practically all of Europe except France, Russia, and Ireland; in Egypt, South Africa, Canada, Australia, and New Zealand, and in Japan and Korea. France, including Tunis and Algiers, uses standard time of the meridian of Paris; Greece, that of Athens; Argentina, of Cordoba; Ecuador, of Quito; Cuba, of Havana, and Ireland, of Dublin In India, Madras time is used very generally by the railroads and telegraphs, but it is usually converted into local mean time for local use. The simplicity and convenience of having the same common standard everywhere are so great in all international relations, the conversion of one time into another thus involving hours only, the minutes and seconds being always the same, that it is hoped soon to have the Greenwich system adopted universally.

THE DESTRUCTION OF POMPEII AS INTERPRETED BY THE VOLCANIC ERUPTIONS OF MARTINIQUE

BY ANGELO HEILPRIN

The eruptions of Pelée throw new light upon the first recorded eruption of Vesuvius, and render intelligible those passages in the Pliny narration which have heretofore been obscure and thought to be opposed by the facts of geology. The "horrible black cloud," scintillating with serpent-flashes of lightning, which is described as rolling *down* the mountain slope and blotting out the landscape, is seemingly the absolute counterpart of the great descending black cloud, similarly charged with electricity, which was the distinctive feature of the Pelée eruption of May 8, 1902. It was manifestly with the issuance of this cloud that Pompeii was destroyed, which was, therefore, on August 25 (not 24th, as generally stated by historians), A. D. 79, as Pliny's narration makes clear that this climax of activity was reached on the second day of the eruption of Vesuvius. The speaker expressed his conviction that Pompeii was not destroyed as the result of simple incineration, as is generally assumed by geologists and others, but in a manner in all probability closely similar to that which annihilated St. Pierre. The numerous deformed objects of porcelain, glass, etc., which, as recovered from Pompeii, were thought to represent long periods of time effecting their deformation, have again their exact counterpart in objects recovered from St. Pierre, where the deformation was accomplished in minutes or seconds.

GAME AND FUR-BEARING ANIMALS AND THEIR INFLUENCE ON THE INDIAN OF THE NORTHWEST

BY TOWNSEND W. THORNDIKE, M. D.

Southward of Hudson Bay and the Canadian barren-lands there lies a vast tract of swampy territory, known as the "Muskeg region." The industrial and commercial outlook for this great stretch of watery lowlands is not encouraging. Ventures in mining, lumbering, and agriculture, even if possible, are most remote. Under these conditions to what profitable purpose may this apparently worthless area be put? Nature has shown us. She has made it a most remarkable breeding ground and abode for many of the valuable game and fur-bearing animals.

Thus guided by nature it is obvious that the duty of the government should be to set aside this Muskeg territory and establish preserves for the propagation of these animals. In this way an economic future of the land will be assured by the resulting development of a permanent fur trade.

Such preserves, besides affording protection to the animals, will give to the Indian inhabitants of the region advantages of the greatest possible benefit in relation to their social and industrial status.

This influence of animal life on the red man has curiously enough been only slightly touched upon by writers, and this is the more astonishing when we reflect upon the role that the wild animal has played in the development of the Indian. Broadly speaking, it can be said that the beasts of the forests and fields are the foundations upon which rest the manners, customs, and characteristics of the North American Indian.

The fact that this influence has never been appreciated is, I believe, one of the chief reasons for failures in our Indian policy.

In the United States it is too late to make a change in the conduct of our Indian affairs. In northern Canada the situation is better, and government action would be rewarded by an increased producing power of a territory rapidly becoming valueless; by the regeneration of a fine type of Indians carrying on their natural occupation of hunting, and independent of state aid, and by the disappearance of the fear of extinction of animal life.

GEOGRAPHIC LITERATURE

The Philippine Islands. 1493-1898. Vol. XVIII. 1617-1620. By Emma Helen Blair and James Alexander Robertson. Pp. 346. 6 by 9½ inches. Cleveland: Arthur H. Clarke Co. 1904.

We can understand present conditions in the Philippines only as we are acquainted with the past. Very fortunately for us and the Philippines, this past history, which has been almost completely hidden from the world, is now being brought to light in the splendid series of volumes edited by Miss Blair and Mr. Robertson. The great importance of the series and its inestimable value to the student of affairs in the Philippines become more apparent with each succeeding volume; the American people, who wish to thoroughly understand the islands and the Filipinos themselves, are under immense obligations to the publishers and editors. The scholarly manner in which the volumes are edited and the clear and permanent character of the printing and paper make the series complete and attractive.

The scope of the present volume extends from 1617 to 1620. The islands are still ravaged at intervals by the Moro pirates from the southern part of the archipelago. Even worse are the losses to the commerce of the islands inflicted by the Dutch. Their ships infest the seas about Luzon, and those of the Moluccas, in which region they are steadily and even rapidly gaining foothold, and securing the best commerce of those islands. Corruption in the management of the Spanish interests in the Spice Islands renders them an expensive and embarrassing possession, and the new governor, Fajardo, finds the same influence at work in the Spanish colony itself, especially among the auditors and other high officials. The colonial treasury is, as usual, short of funds, and can do little to defend the islands from the Dutch. The Madrid Government is unwilling to spend much more on the Philippines, although beset with importunities to save that colony, and Spanish commerce generally, from the insolent Dutch. The usual building of ships in the islands has so harassed and exhausted the unfortunate natives that it is necessary to have ships built for the Philippines in India and other countries where time and labor are more abundant.

BOOKS RECEIVED.

Great American Canals. Vol. I. The Chesapeake and Ohio Canal and the Pennsylvania Canal. By A. B. Hulbert. With maps and illustrations. Pp. 232. 5½ by 7½ inches. Cleveland: Arthur H. Clarke Co. 1904.

The South American Republics. Part two: Peru, Chile, Bolivia, Ecuador, Venezuela, Colombia, Panama. By Thomas C. Dawson. With maps and illustrations. Pp. 513. 5½ by 8 inches. New York: G. P. Putnam's Sons. 1904.

Sweden. Its people and its industry. Historical and Statistical Handbook. By Gustav Sundbarg. With numerous illustrations. Pp. 1106. 6½ by 9½ inches. Stockholm: P. A. Nordstedt & Soner. 1904.

The Norwegian North Polar Expedition, 1893–1896. Vol. IV. Scientific results. By Fridtjof Nansen. With diagrams and charts. Pp. 231. 9 by 11½ inches. New York: Longmans, Green & Co. 1904.

Africa from South to North through Morotseland. By Major A. St H. Gibbons. Two Vols. With maps and many illustrations. Pp. 290 + 296. 6 by 9 inches. New York and London: John Lane. 1904.

De La Côte D'Ivoire au Soudan et a La Guinée. Par Le Capitaine D'Ollone. With maps and many illustrations. Troisième Edition. Pp. 311. 6½ by 10 inches. Paris: Librairie Hatchette et Cie. 1901.

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